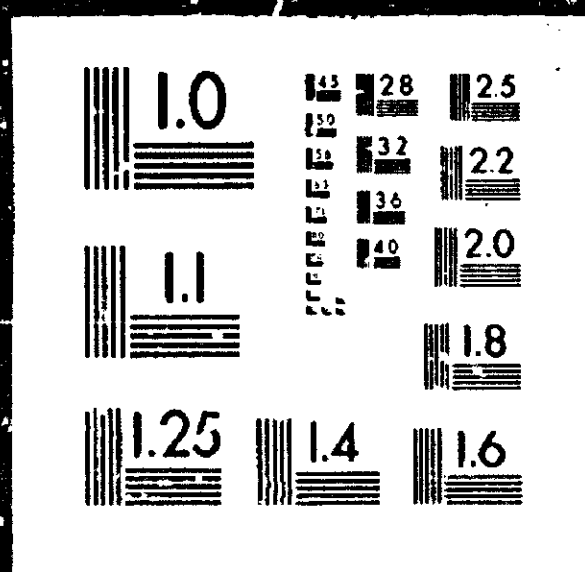


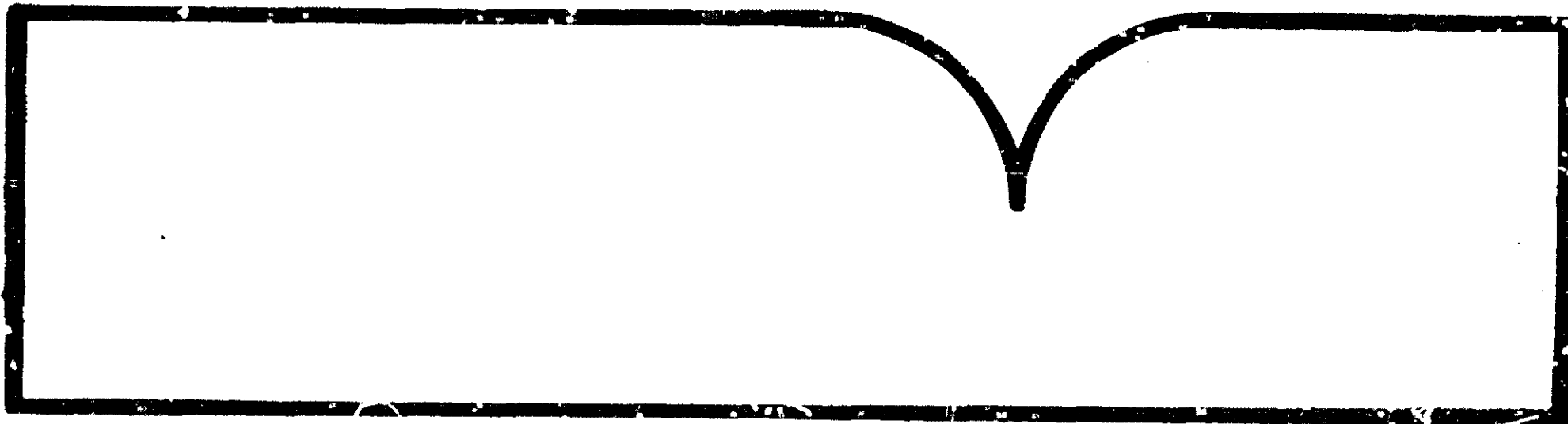
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Safety Effectiveness Evaluation of the National
Highway Traffic Safety Administration's
Rulemaking Process. Volume 4. Analysis,
Conclusions, and Recommendations

(U.S.) National Transportation Safety Board
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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

SAFETY EFFECTIVENESS EVALUATION OF THE
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S
RULEMAKING PROCESS

Adopted: April 15, 1980

VOLUME 4—ANALYSIS, CONCLUSIONS AND RECOMMENDATIONS

INTRODUCTION

The Independent Safety Board Act of 1974 authorizes the National Transportation Safety Board to "evaluate, assess the effectiveness, and publish the findings of the Board with respect to the transportation safety consciousness and efficacy in preventing accidents of other Government agencies." In an introductory section to the Act describing the need for an independent Safety Board, Congress indicates that the conduct of this and other Board responsibilities requires "continual review, appraisal, and assessment of the operating practices and regulations" of Federal agencies involved in transportation regulation. In order to fulfill these and other responsibilities, the Board conducts investigations and makes recommendations to appropriate regulatory agencies.

The Safety Board has conducted an evaluation of the motor vehicle safety standard rulemaking process of the National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (DOT). This report presents the analysis and conclusions of the Board's investigation and constitutes the fourth and final volume of the evaluation study. The three previously issued reports in this study include case histories of Federal Motor Vehicle Safety Standard (FMVSS) 121, the air brake systems standard, ^{1/} FMVSS 208, the occupant crash protection standard, ^{2/} and current rulemaking of the NHTSA. ^{3/} The case histories do not attempt to evaluate or draw conclusions about standards or the rulemaking process, but develop a factual basis upon which the analysis presented in this report is based. Readers who are unfamiliar with the standards covered by the case histories or with the rulemaking process of the NHTSA are referred to these volumes for detailed explanation.

The Safety Board's evaluation of NHTSA rulemaking also responds to a directive from the House Committee on Public Works. ^{4/} The Committee stated

^{1/} Vol. 1—Case History of FMVSS 121: Air Brake Systems, August 2, 1979 (NTSB-SEE-79-4).

^{2/} Vol. 2—Case History of FMVSS 208: Occupant Crash Protection, September 28, 1979 (NTSB-SEE-79-5).

^{3/} Vol. 3—Case History of the Current Rulemaking of the NHTSA, February 15, 1980 (NTSB-SEE-80-2).

^{4/} U.S. House of Representatives, Report No. 95-1169, Part I, May 15, 1978, p. 3; Joint Hearings before the Subcommittee on Aviation and the Subcommittee on Surface Transportation of the House Committee on Public Works and Transportation, 95th Congress, 2nd Session, NTSB Authorization Hearings, April 19 and 20, 1978.

that the Board's greatest contribution to highway safety lies "in the field of oversight over the activities of other agencies with highway safety responsibilities." The Safety Board interpreted this statement as a directive to thoroughly examine the NHTSA's rulemaking process, including "an evaluation of truck braking standards [FMVSS 121] and passive restraint systems [FMVSS 208]." In addition, the Board was asked to consider the NHTSA's "use of research and other technical materials in the exercise of its regulatory authority" The three case histories and this concluding analysis are intended to meet this Congressional directive. 5/

The Safety Board's concern in this evaluation has been, first and foremost, with increasing the safety afforded American motorists through regulation of vehicle performance characteristics. The goal of this evaluation, therefore, is to promote increased safety by recommending ways that the rulemaking process used to develop motor vehicle safety standards can be improved.

Through its evaluation, the Safety Board has identified several essential elements in the rulemaking process. These include problem identification based on sufficient data, consideration of alternative solutions to a specific problem, public involvement in the decisionmaking process, and evaluation of standards put into effect. These elements constitute the basis of analysis in this report and will be discussed in the context of examples of past and present rulemaking. It should be added that these elements and their importance are recognized in both DOT and NHTSA procedural orders.

This analysis was developed by the Safety Board through review of the NHTSA public dockets, internal NHTSA memoranda, technical literature, and research test reports. The Safety Board staff conducted interviews with Federal safety officials (inside and outside the NHTSA), 6/ representatives of the automobile and trucking industries, members of the research community, and other persons involved in the promotion of highway safety. These interviews were used to supplement the data collected from official sources. While the basis for most of this analysis can be found in the previously mentioned case histories, other sources of information have been used. Where these additional sources have been drawn upon for analysis in this report, appropriate references are included in the text.

It must be pointed out that this report does not specifically address the technical adequacy of any of the standards studied. Of course, a proper evaluation of the rulemaking process necessarily involves discussion of some technical aspects of the standards. But the major emphasis in this report is directed to an analysis of the process by which the NHTSA conducts its rulemaking for safety standards.

Several additional points should be kept in mind in interpreting this evaluation. First, the Safety Board had neither the time nor resources to consider in its evaluation every safety standard issued by the NHTSA. Therefore, a carefully chosen representative sample was selected.

5/ A letter describing the Safety Board's evaluation project was forwarded to the Committee on Public Works and Transportation on August 15, 1979.

6/ This report carefully differentiates between statements made by individual members of the NHTSA staff and official positions of the agency. Positions expressed by staff members are essential to an understanding of the rulemaking process, but do not necessarily represent the official position of the NHTSA.

Second, the NHTSA has major rulemaking responsibilities in addition to safety standards, such as fuel economy standards. Staff resources, therefore, are not exclusively devoted to the development of safety standards.

Third, and perhaps most important, the NHTSA rulemaking process cannot be evaluated in a vacuum. The NHTSA is only one of many government agencies conducting rulemaking. Therefore, this report must be viewed from the perspective of the overall regulatory environment. The processes used by various agencies are not necessarily similar and are by no means equally effective. A recent study by the Office of Management and Budget (OMB) evaluated the regulatory processes of most of the Departments and Agencies of the Executive Branch.^{7/} The DOT received a favorable evaluation in that study. The OMB concluded:

The Department of Transportation is a leader in carrying out the President's Executive Order. Policy oversight is strong in the Department both as a result of its program existing before the Order and the continuing commitment of senior level officials. The Department has gone beyond the Order in instituting public participation programs and has created several unique opportunities for public involvement. The Department's review of existing regulations is already showing concrete results. More effort is currently being focused on the regulatory analysis/evaluation requirement and the effort to improve "plain English" and further improvements in these two areas should be noted in the future.

The report is divided into three parts. The first section examines the NHTSA's past rulemaking process by analyzing two significant examples, FMVSS 121 and FMVSS 208. The second section analyzes current rulemaking of the NHTSA. The final section presents the conclusions of this report and specific recommendations.

PART I

ANALYSIS OF THE PAST NHTSA RULEMAKING PROCESS

This section of the report provides a historical perspective on the NHTSA's rulemaking. The section consists of two parts: analyses of the rulemaking process associated with the air brake systems standard (FMVSS 121) and the occupant crash protection standard (FMVSS 208). These two regulations have been in various stages of development from their origins in the late 1960's up to the present. In addition, these rules are acknowledged by the NHTSA to be two of the most significant examples of rulemaking attempted by the agency. Both of these standards were developed before many of the present rulemaking requirements were in effect. However, the standards serve as illustrations of the effects of various rulemaking procedures and are therefore analyzed in light of the more recent rulemaking requirements. Every effort has been made to identify these differing requirements, where applicable.

^{7/} "Improving Government Regulations, A Progress Report," Office of Management and Budget, September 17, 1979.

The analysis of FMVSS's 121 and 208 focuses on certain aspects of the rulemaking process. These include, though are not limited to, problem identification, consideration of alternatives, public involvement, and evaluation of standards in effect. It should also be pointed out again that this report does not analyze the technical adequacy of either of the regulations, but examines them in the context of the rulemaking process.

FMVSS 121: Air Brake Systems

The air brake system standard, FMVSS 121, specified performance requirements for service, emergency, and parking brake systems for heavy trucks, buses, and trailers. The standard was first issued in June 1970, and, after several delays, finally became effective for most trailers in January 1975 and for most heavy trucks and buses in March 1975.

FMVSS 121 has led to many improvements in heavy vehicle braking systems and the majority of these improvements have not been widely contested over the years. However, much controversy arose concerning the use of antilock devices to meet the stopping distance requirements of the regulation. Such devices were designed to prevent wheel lockup during braking, thus increasing a vehicle's ability to stop and the control afforded the driver. This controversy surrounding antilock devices led to litigation and a ruling of the U.S. Court of Appeals for the Ninth Circuit. The court's decision 8/ invalidated, among other sections, the 60-mph stopping distance requirement and the "no lockup" portions of the standard. In February 1979, the NHTSA started rulemaking on a new standard, FMVSS 130, to replace FMVSS 121.

The purpose of the Safety Board's analysis of FMVSS 121 is not to determine the technical adequacy of the standard, nor is it the purpose of this analysis to second-guess the decisions made by NHTSA officials in the past. This analysis does, however, demonstrate clearly the results of certain rulemaking procedures followed during the development of FMVSS 121. Therefore, it is the purpose of this evaluation to study the effectiveness of these procedures and consider their relevance to the current rulemaking procedures of the NHTSA.

The NHTSA first issued FMVSS 121 as a Notice of Proposed Rulemaking (NPRM) in June 1970. Advance Notices of Proposed Rulemaking (ANPRM's) which had been issued in 1967 and 1969 were essentially general proposals to extend passenger car braking standards to truck braking. The 1967 ANPRM listed braking for trucks, trailers, and buses as 1 of 47 items on which comment was solicited. The manufacturers' comments reflected an industry in which development of brake technology lagged behind that of other modes of transportation. For example, an antilock braking system was introduced in 1948 for use on aircraft. That system was adapted for use by the heavy trucking industry in 1959 but use was primarily limited to tank trucks. 9/ By 1970, antilock systems were still considered a newly

8/ PACCAR v. NHTSA and DOT (573 F. 2d 632 (9th Cir. 1978), cert. denied, October 2, 1978).

9/ Case History of FMVSS 121, p. 5.

developing technology. In fact, most commenters on the ANPRM's believed there were no definitive data on heavy vehicle braking and that advanced systems, specifically antilock systems, were unproven. ^{10/} Very few data were available from industry on developmental testing of braking systems and the NHTSA had sponsored only one comprehensive research project which was still in the early phases of development when the NPRM was issued. It also appears that the NHTSA never attempted to collect data by conducting or reviewing accident investigations. In the original Notices, the agency did not make specific reference to any accident data that illustrated the need for a safety standard.

The NHTSA never clearly defined the specific problem which FMVSS 121 was designed to overcome. The agency did not identify the class of heavy vehicle accidents it was trying to correct by implementing the standard. Consequently, it was never clear whether FMVSS 121 was designed to avert accidents caused by ineffective foundation brakes, by loss of lateral stability, or by improper reactions by drivers. Without such analytical information, the NHTSA was unable to carefully design a true performance standard to address a specific problem, and was unable to clearly relate any of the standard's provisions, such as "no-wheel lockup," to accident data.

A number of circumstances contributed to this situation. The Safety Board conducted interviews with the individuals directly involved with the drafting of FMVSS 121 and has determined that the primary motivation for rulemaking at this time was to establish regulations for the trucking industry before legislation to permit increases in truck size and weight limitations was enacted. In addition, these individuals indicated that the pressure for quick results precluded research projects or accident data analysis to develop the drafts for FMVSS 121. ^{11/} A review of the events prior to the issuance of the NPRM supports these findings. The first internal document which the NHTSA prepared concerning the development of FMVSS 121 was a February 3, 1970, memorandum from the Director of the Motor Vehicle Safety Performance Service on the need to improve safety standards in light of the impending legislation to authorize size and weight increases for trucks. It also acknowledged "the lack of substantive data currently available to the [NHTSA]." ^{12/}

Another indication of the lack of definitive data was the statement in the February 1970 memorandum that a contract with the Highway Safety Research Institute (HSRI) (contract FH-11-729D) would provide substantiation for the criteria selected for the NPRM. In fact, the HSRI contract had been awarded on June 20, 1969, and preliminary results of baseline vehicles had been sent to the NHTSA on December 9, 1969. The HSRI's testing of advanced systems, including antilock, did not even begin until July 1, 1970—12 days after the June 1970 NPRM was issued. ^{13/}

^{10/} Ibid., p. 7.

^{11/} Ibid., p. 10.

^{12/} Ibid., p. 9.

^{13/} Ibid., p. 15.

The NHTSA's failure to identify a specific problem which it expected to overcome with the standard is also illustrated by the vehicles the NHTSA selected to be covered by the requirements of the standard. The February 3, 1970, memorandum indicated that "buses and small trucks [would] be handled on a lower priority basis" and would not be included in the NPRM. The drafting engineer decided to include buses because he "felt" that they should also be regulated. That engineer also stated that the standard was drafted on an entirely intuitive basis without the use of accident data or careful analysis of the ANPRM docket comments. 14/

The NHTSA staff members involved with drafting FMVSS 121 never fully comprehended the nature of the industry they were trying to regulate. The safety standard engineer who drafted the standard had only limited experience with the trucking industry and interviews with staff members revealed that in 1970 they were unaware of many of the industry's maintenance and operational practices. For example, the trucking industry historically had had trouble maintaining relatively simple electrical tail light systems. Yet the antilock devices used to meet the standard required a large number of electrical connectors which became a source of repeated failure as antilock devices were introduced.

A final point which precluded even an attempt to analyze the safety problem was a conscious decision stated in the February 3, 1970, memorandum, to "utilize the considerable time now devoted to the backup papers, such as Engineering Position Paper and Executive Summary. . ." to draft the final NPRM. 15/

During interviews with the NHTSA staff, numerous references were made to an alleged agreement between the DOT and the trucking industry that the DOT would not oppose increases in truck size and weight limitations if stricter safety standards, braking in particular, were met by the industry. This compromise was first raised in 1963 in a policy statement of the American Association of State Highway Officials (AASHO) 16/ that increases should be accompanied by minimum performance standards. The "quid pro quo" of increased truck size and weight allowances for Federal standards for truck braking performance was mentioned indirectly in the many hearings the Congress held to consider the issue between 1963 and 1975 when the legislation authorizing the increases was signed into law by the President. The NHTSA staff who were interviewed indicated that the compromise agreement was in effect in February 1970 when FMVSS 121 was first drafted. In addition, the safety standard engineer stated that he disregarded many of the NPRM comments from the industry because of this pending compromise.

14/ Ibid., p. 10.

15/ Ibid., p. 8.

16/ AASHO [now the American Association of State Highway and Transportation Officials (AASHTO)]. "Policy on Maximum Dimensions and Weights of Motor Vehicles to be Operated over the Highways of the United States," adopted October 21, 1963.

The Safety Board has not been able to substantiate the existence of such a prior agreement, but such a "trade off" could possibly have been in effect when FMVSS 121 was drafted. The implication raised by the NHTSA staff was that with this compromise in effect, efforts to define and analyze in detail the specifics of the safety problem were unnecessary. This may in fact have been the understanding of the NHTSA staff when the standard was drafted. The important fact is that, for whatever reason, the NHTSA did not analytically study what specific problem the standard was intended to solve. The purpose of this report is not served by an analysis of whether alleged political agreements explain the NHTSA's omission of this important rulemaking step. For the purpose of this analysis it is enough to say that the NHTSA did not define the safety problem to the maximum extent possible, and, as a result, certain predictable problems were encountered later when the standard was challenged and could not be properly supported or evaluated. That failure to adequately define the problem was a shortcoming of the rulemaking procedure used for FMVSS 121 and had a very definite effect on the viability of the standard.

From the initial stages, the NHTSA treated FMVSS 121 as an "antilock standard" even though the agency repeatedly professed that other systems were acceptable. For example:

- o During the initial meeting with an NHTSA-selected "advisory group" on March 9, 1970, the NHTSA said that it "wanted to encourage antiwheel-locking devices." 17/
- o The stopping distances required by the final rule on February 19, 1971, were essentially those attained by the prototype antilock-equipped vehicle in the HSRI testing. 18/
- o Throughout the development of the standard, the NHTSA made comments in notices implying strong support for antilock brake systems, sometimes softened by what appeared to be editorial qualifications such as "(if utilized by a manufacturer)." 19/

The testing and preliminary evaluation of alternative technical solutions were limited. A total of five advanced systems were tested in the HSRI study, but they (and the antilock) were prototype systems and extremely difficult to maintain in an operational condition. No other reliability testing of alternate systems was performed by the NHTSA until after the standard was in effect in 1975.

In addition to limited consideration of technical alternatives, the NHTSA repeatedly rejected other alternative regulatory approaches. For example, much of the industry suggested including only certain classes of vehicles in the standard's coverage, and the HSRI and the National Motor Vehicle Safety Advisory Council suggested a multistep phase-in of the requirements. The NHTSA rejected both approaches in the early stages of the standard and resisted any subsequent alternative suggestions. 20/

17/ Case History of FMVSS of 121, p. 9.

18/ Ibid., p. 16.

19/ Ibid., p. 23.

20/ Ibid., pp. 12, 17, and 18.

FMVSS 121 generated a large volume of public comment, but the NHTSA's use of this comment and its effect on the development of the standard are unclear. For example, the original NPRM did not respond to comments submitted for the previous ANPRM's. This proved to be unfortunate since the comments of the American Trucking Associations, Inc., (ATA) were prophetic concerning the fate of a rushed standard. In addition, the initial "advisory group" warned the NHTSA in March 1970 that antilock devices would be required by the short stopping distances and that those devices would not be ready in time to meet the standard's effective date. The NHTSA did not accept that advice.

It also appears that the NHTSA did not allow sufficient time for detailed comment by the industry after the original NPRM. The initial notice was issued on June 25, 1970, and allowed 87 days for the preparation of comments on a standard which proposed fundamental changes to the braking systems of a large portion of the trucking industry. The industry advised the NHTSA that detailed comment could not be prepared in that length of time because testing was required to collect data on the feasibility of the proposed specifications. Immediately following the publication of the NPRM the NHTSA received two petitions requesting an extension of the comment period. However, both were rejected by the agency. 21/

The public docket did not contain any documentation of the basis for the decision to implement the air brake standard. The Heavy Duty Truck Manufacturers Association complained that it had searched all applicable dockets but could find no supporting documents for the NPRM. 22/ The Safety Board's review of the public docket supports that contention.

The NHTSA was petitioned repeatedly for delays or amendments to the standard which were routinely denied with statements such as "The NHTSA has found that..." or "The Administrator has determined that..." Searches by Safety Board staff of the docket and NHTSA-sponsored research have found no documentation of the bases for such determinations.

To be certain, not all of the comments received by the NHTSA were opposed to the implementation of FMVSS 121's requirements. State highway departments forwarded accident investigation reports recommending that the NHTSA take immediate action to improve heavy vehicle braking. In a letter to the Administrator, Mr. Ralph Nader criticized the NHTSA for weakening the criteria of FMVSS 121 and delaying its implementation schedule. 23/

During the FMVSS 121 rulemaking, the Safety Board made a number of specific safety recommendations to the NHTSA concerning heavy vehicle braking. The Safety Board specifically recommended that the NHTSA initiate an experimental safety vehicle testing program to encourage the speedy advance of the state-of-the-art in heavy-duty vehicle braking much as had been done in the commercial aviation safety field. 24/

21/ Ibid., p. 11.

22/ Ibid., p. 12.

23/ Ibid., p. 20.

24/ Ibid., p. 20.

The NHTSA was also requested on numerous occasions to conduct public meetings and demonstrations. The NHTSA responded to these requests and sponsored some limited testing of FMVSS 121-designed vehicles, such as the demonstrations at East Liberty, Ohio, in November 1973. However, even after repeated offers from organizations such as the ATA, the NHTSA did not implement controlled testing of FMVSS 121 systems until 1975 and never sponsored wide-scale demonstrations of these systems on operating vehicles.

Another example of the NHTSA treatment of public involvement in the rulemaking procedure was the "eleventh-hour" reversal proposed in its December 16, 1974 NPRM. The NHTSA requested detailed comments on postponing or cancelling the standard, which otherwise was to be effective in 16 days. The public was allowed 10 days, including Christmas Day, to prepare and submit comment. The NHTSA issued its decision to proceed with the scheduled implementation on December 31, 1974, 1 day before the standard was effective for trailers. 25/

The Council on Wage and Price Stability (CWPS), which did prepare comments in the allowed 10-day period, strongly criticized the NHTSA for an inadequate analysis of the economic impact of the standard and for the fact that the analyses which had been done were not made public. The NHTSA did not respond to the CWPS's request for public disclosure but did undertake, at the urging of the CWPS, a new cost/benefit study of FMVSS 121. That study, which was called the "Quick-Look" study by the NHTSA, formed the beginning of a series of evaluation efforts by the NHTSA. The "Quick-Look" study was completed in April 1975 but was not made public until October 1975. The CWPS reviewed the "Quick-Look" study and found little reason for disagreement on the cost side. However, the CWPS still disagreed on the estimated benefits that the NHTSA claimed would result from FMVSS 121. 26/

The "Quick-Look" study which was completed after the standard was in effect marked the first step in what was to become the NHTSA evaluation program for FMVSS 121. However, the lack of adequate problem identification for FMVSS 121 seriously hampered the efforts at evaluation. Without a clear statement of the problem, the NHTSA had to spend valuable time collecting and coordinating information in an attempt to define what it was the evaluation effort would be trying to measure. Careful problem identification in the earlier stages of rulemaking would have answered the question in detail. Also, the NHTSA was unsuccessful at coordinating all the elements of the evaluation program. For example, the NHTSA's Office of Standards Enforcement did not plan to test for compliance initially because it wanted to allow the manufacturers time to "work out the bugs" in their systems. The compliance plan was not developed until late 1975 and actual testing did not begin until December 1976, nearly 2 years after the effective date of the standard. 27/

25/ Ibid., pp. 26-27.

26/ Ibid., p. 30.

27/ Ibid., p. 40.

There was no active defects program to identify, investigate, and require correction of alleged safety defects in FMVSS 121 systems until 1977. Up to that time the NHTSA collected information on antilock defects, but it never actively investigated cases, relying on the manufacturers to conduct the investigations.

Accident investigation was restricted to those accidents in which an FMVSS 121 failure was alleged. There was no planned accident data collection for representative braking-related accidents, or accidents involving vehicles with air brakes, so that comparisons in accident causes could be related to components of the brake system.

The Bureau of Motor Carrier Safety (BMCS) of the Federal Highway Administration and the NHTSA decided against requiring that antilock systems be kept operational in the period immediately after the standard became effective. In a letter to the Safety Board on May 25, 1979, the Administrator of the NHTSA offered the following comment on the interaction between the NHTSA and the BMCS:

It should be pointed out that BMCS has been part of the internal coordination process on all Federal Register notices on FMVSS 121. In addition, the NHTSA never intended for BMCS to enforce the operational status of antilock immediately when 121 took effect. There was to be some period of leniency until the introductory problems of training and parts supply were overcome. There was no disagreement between NHTSA and BMCS on this. The disagreement came later, after 121 had been in effect for over a year. The NHTSA then thought that BMCS should start rulemaking action leading to eventual enforcement, while BMCS essentially took the posture that they didn't want to propose any enforcement until the PACCAR case was settled.

The only planned and coordinated effort on the part of the NHTSA to evaluate the effect of FMVSS 121 was the HSRI Fleet Evaluation Program. ^{28/}That program had serious shortcomings in its design that were difficult to overcome. For example, the NHTSA staff had wanted to include accident causation and a component-by-component analysis in the study. Because of the large sample size that would be required in order to measure effects of these differences, the NHTSA decided to eliminate those elements.

Without the accident causation information, the NHTSA was unable to attribute the subsequently reported increases in accident rates to any specific cause. Without a component-by-component analysis, including an investigation of the basic foundation brakes, the NHTSA was unable to relate the benefits and disbenefits reported by the HSRI to any one provision of the standard. Therefore, the highly controversial component, antilock, could not be effectively evaluated. In effect, the NHTSA relied totally on gross measures of safety benefit or disbenefit to evaluate FMVSS 121.

^{28/} The HSRI Fleet Evaluation Program was a contractual effort designed by the NHTSA staff and formed the main thrust of the NHTSA's efforts to measure the effects of FMVSS 121.

Two other circumstances have seriously undermined the value of the HSRI Fleet Evaluation Program. First, the standard was repeatedly amended throughout the period of evaluation making it difficult to identify the type of vehicles being evaluated. Second, the vehicles studied were not checked to see if the antilock devices had been disconnected, in spite of reports that a large percentage had been. Therefore, the benefits of the "no wheel-lockup" provision of the standard have never been measured.

In addition to the HSRI effort, the NHTSA did make some other efforts to monitor the safety impact of FMVSS 121. Unfortunately, those efforts were started too late and were not effectively coordinated. Administrator John Snow initiated two studies by Transportation Research and Marketing, Inc. (TRAM) in 1976 and 1977. In retrospect, the TRAM studies did contribute valuable information, but when they were presented they lacked the substantiation necessary for the NHTSA to take appropriate actions. 29/

The NHTSA sponsored 12 multidisciplinary investigations of accidents allegedly caused by malfunctioning FMVSS 121 systems. These investigation reports have been reviewed by the Safety Board and were found to vary in quality due to a number of factors, such as the time delay between the accident and notification of the investigation team. Six of the reports clearly showed that the accidents were not caused by FMVSS 121 components; four reports did not contain sufficient detailed evidence to support or refute a causal relationship to an FMVSS 121 component; and, contrary to the contractor's analysis, two of the reports show a causal relationship to FMVSS 121 components (but not antilock components).

Attempts to examine the relationship of antilock or any FMVSS 121 component to accident causation or prevention have proven inconclusive. For example, the Safety Board conducted investigations of three major accidents in which an FMVSS 121 component was alleged to have played a causative role. Those reports have failed to show any clear causal relationship between an antilock component and accident initiation or outcome.

The NHTSA Task Force, formed in April 1977 to evaluate FMVSS 121, reviewed the results of other analytical evaluation efforts. The task force was an in-house group composed almost exclusively of NHTSA personnel. The review of FMVSS 121 which was conducted by the task force was extensive and the study did identify in a general way public attitudes toward the standard. However, the review did not provide additional analytical information concerning the effectiveness of the regulation.

The effects of delayed implementation of effective compliance testing, defect monitoring, and BMCS enforcement continued to make useful information unavailable to the NHTSA. The fundamental problems with NHTSA evaluation efforts were that the specific safety problem was not defined and that the efforts that were made were not timely, coordinated, or structured. Therefore, each of the individual efforts had flaws and the total of all of the efforts did not produce meaningful data.

29/ Ibid., p. 38.

FMVSS 208: Occupant Crash Protection

The development of FMVSS 208 ^{30/} has been a long, complex, and controversial process. Rulemaking to mandate passive restraints began in July 1969 and the protection mandated by the current standard is not required to be available in all passenger cars until September 1983. The regulation has been modified numerous times; it has undergone major review by different administrations within the DOT; it has been challenged in the courts twice; it has been evaluated by Congressional committees as well as by a variety of other organizations; and it has generated a vigorous public debate which continues to this day.

The origins of rulemaking on FMVSS 208 and passive restraint lie in several interrelated factors occurring in the late 1960's. First, highway deaths had risen to over 55,000 per year. Congress, in passing the National Traffic and Motor Vehicle Safety Act of 1966 (the Safety Act of 1966), ^{31/} had recognized the imperative need for the Federal government to take steps to reduce this tragic and unnecessary toll, and established the NHTSA with the express mandate of developing safety regulations to reduce the number and severity of highway accidents.

Second, seatbelts, mandated by the initial standard 208 in February 1967, were failing to adequately prevent injury and death. This was occurring not because seatbelts were ineffective, but because a substantial percentage of vehicle occupants did not use them. Complementing this fact was a general sense by the NHTSA and other safety experts that seatbelt usage rates were unlikely to improve and that mandatory seatbelt usage laws could not be enacted in the United States.

The third significant factor preceding rulemaking on passive restraints was the development of a new technology--the inflatable restraint or air bag. General Motors (GM), the Ford Motor Company (Ford), and a component manufacturer, Eaton, Yale and Towne (Eaton), had initiated basic developmental work during the 1950's and early 1960's. By 1968, an HSRI study indicated the air bag to be a potentially effective restraint, and Ford and Eaton stated in a Society of Automotive Engineers (SAE) paper that early work on the air bag "... showed levels of survivability unapproached by any other known restraint system..." ^{32/}

Rulemaking to change FMVSS 208 was initiated by an ANPRM in July 1969. ^{33/} In the notice, the NHTSA introduced two concepts--passive restraint and inflatable restraint--and requested comment on several significant issues related to these concepts. Following the issuance of the ANPRM, the NHTSA held a 2-day public meeting in August 1969, and collected written responses to both the notice and the meeting in a public docket set up for that purpose.

^{30/} FMVSS 208 was issued in February 1967 and mandated seatbelts for passenger cars. In July 1969, an ANPRM began a rulemaking process which was to establish a standard to supercede this initial rule. "FMVSS 208," as it is used in this report, refers to this rulemaking effort, unless otherwise noted.

^{31/} P.L. 89-563, September 9, 1966; 15 U.S.C. 1381 et seq.

^{32/} R.M. Kemmer, et al., "Automotive Inflatable Restraint System," SAE Paper 680033, January 8-12, 1968, p. 9, as quoted in the Case History of FMVSS 208, p. 6.

^{33/} Docket 69-07-Notice 1; 34 FR 11148.

An NPRM followed the advance notice 10 months later, in May 1970.^{34/} This notice specified details of the proposed rule, describing injury criteria to be met using a testing dummy in three test crashes—frontal, lateral, and rollover. Beginning January 1, 1973, full passive protection was to be provided for all passengers in all these crash modes at specified crash test speeds. The publication of this notice was followed almost immediately by a major international conference on passive restraints (the NATO Conference) in May 1970, and by a second public meeting in June 1970. Comments on the NPRM and on issues raised at the meetings were collected in the docket.

At this point in the rulemaking process, the NHTSA had good reason to feel encouraged about its proposal. Developmental testing in 1968 and 1969 appeared promising. In a 1968 meeting between the major automobile manufacturers and NHTSA Director Dr. William Haddon, the industry had supported the potential of the concept.^{35/} Furthermore, in the public meetings of 1969 and 1970 and in many docket comments, the industry, while cautious in its public statements, agreed that major progress had been made with the air bag.^{36/} Finally, in the June 1970 public meeting, GM proposed to offer air bags as an option in 150,000 model year 1973 vehicles.^{37/}

In spite of the promise of these early developments, however, controversy over the proposed standard soon began to arise. While the concerns of industry, the Congress, the media, and other groups all contributed to the growing debate, certain problems were either caused or aggravated by aspects of the regulatory process followed in developing FMVSS 208. It should be pointed out that at the time the first notices were issued, NHTSA Order 800-1^{38/} was not yet in effect, and it appears that in these early years of the agency's history, formal rulemaking procedures had not yet been clearly established. Nonetheless, the Safety Board believes that an analysis of the rulemaking procedures associated with FMVSS 208 indicates shortcomings which are instructive for the present.

FMVSS 208 as it was initially developed was clearly an air bag standard. While it is true that the rule was directed to a general safety problem, 55,000 highway deaths per year, in fact it was largely shaped by the NHTSA's preoccupation with the development of the air bag. The 1969 ANPRM was entitled "Inflatable Occupant Restraint Systems"; the first public meeting provided an "orientation on the subject of inflatable passive restraints"; all papers at the NATO international conference on passive restraints (May 1970) were devoted to air bags, as were virtually all presentations at the second public meeting in June 1970. This concentration on air bags was specifically noted in a letter to the docket by Hamill Manufacturing Company (Hamill). Hamill was developing a deploying net system and questioned the NHTSA as to whether in its focus on air bags it was not equating this technology with passive restraint.^{39/}

^{34/} Docket 69-07-Notice 4; 35 FR 7187.

^{35/} Case History of FMVSS 208, p. 6.

^{36/} See, for example, statements by GM and Ford as quoted in Case History of FMVSS 208, pp. 7 and 13.

^{37/} Ibid., p. 14.

^{38/} NHTSA Order 800-1 describes in detail the procedures by which safety standards are to be developed. The order was first issued in November 1972, and was revised and reissued in February 1977.

^{39/} Case History of FMVSS 208, p. 10.

The NHTSA is required by the Safety Act of 1966 to issue only performance standards and is thus restricted from specifying the design of any particular safety device. In the first NPRM, the agency retitled the proposal and discussed it in terms of passive restraint in general, one example of which, it suggested, might be air bags. In a notice of November 1970, the NHTSA responded to docket comments that it favored the air bag system. The agency wrote:

While air bag systems are certainly one promising method of providing passive protection, it should be understood that other types of systems, such as fixed cushioning of the vehicle interior, self-fastening belt systems, and crash-deployed nets or blankets . . . are equally acceptable methods to the extent that they satisfy the requirements of the standard. 40/

The standard itself, moreover, both as it was first proposed and as it is now written makes no mention of air bags, but sets performance criteria for crash protection to be measured on an anthropomorphic testing dummy. Thus, in a literal sense, FMVSS 208 is a performance standard which has never mandated air bags.

Nevertheless, the NHTSA's focus on the air bag has been clear from the initiation of the passive restraint rulemaking and has continued throughout the history of the standard. NHTSA officials have often used the terms "passive restraint" and "air bag" synonymously. From 1967 to 1974, funding for air bag development accounted for 89.9 percent of all funds allocated for passive restraint research. 41/ Of nearly 2,600 occupant restraint systems tested between 1969 and 1979, over two-thirds of the tests involved air bags. Finally, as part of its argument in the Pacific Legal Foundation/Ralph Nader and Public Citizen court case in 1979, the DOT ~~explicitly~~ stated that part of its intent in the FMVSS 208 rulemaking was to encourage the installation of air bags over passive belts.

The Safety Board believes that the NHTSA's focus on the air bag prevented sufficient exploration of alternatives. In particular, passive belts have been, until recently, virtually ignored by the NHTSA; the NHTSA's passive belt testing has consisted of 32 tests done in 1972, and 79 tests in 1975. Development had been started by Volkswagen and others between 1970 and 1972, and eight papers read at the Second International Conference on Passive Restraint in May 1972 described developments in passive belts. Yet even the original language of the standard reflected a bias against passive belts. In July 1971, the NHTSA amended the rule and inserted a paragraph on passive belts. The wording of the regulation had not considered them and questions had been raised "as to whether a passive belt must be used in conjunction with active belt systems or [must] conform to the adjustment, latching, and warning system requirements applicable to active belts." 42/

40/ Docket 69-7; Notice 7; 35 FR 16927 (November 3, 1970).

41/ Case History of FMVSS 208, pp. 12 and 44.

42/ Docket 69-7; Notice 10; 36 FR 12859 (July 8, 1971).

As a result of concentration on the air bag, argument concerning FMVSS 208 has become unnecessarily restricted. Controversy which has arisen has centered not so much on the standard itself, but on the air bag. The NHTSA has reacted strongly supporting its rule but, because of its investment in the air bag, has defended the air bag when it should have been defending the more general concept of required levels of occupant protection. To this extent the NHTSA itself has contributed to much of the controversy which has surrounded FMVSS 208. A wider range of alternatives would have given industry, Congress, and the public a broader choice, and debate might have centered more on appropriate levels of required protection, the adequacy of test specifications, and other details of proposed passive restraint, rather than on air bags--yes or no.

A broader problem which became evident early in the rulemaking for FMVSS 208 was that problem identification lacked specificity and that data simply did not exist in 1969, 1970, and 1971 to support a standard as complex as the proposed rule. An NHTSA official acknowledged at the first public meeting (August 1969) that the agency had only limited data on the air bag. At the second meeting the following year (June 1970), another agency official admitted that in some cases data to support the standard's proposed injury criteria were not available. Concerning this issue, a 1970 letter to the docket from Chrysler (United Kingdom) stated that, apart from the head injury criteria, "we know of no published data which could have been used as a basis for the injury criteria levels given. . . ." ^{43/} The absence of definitive biomechanical data was reflected in changes to injury criteria in both the proposed and final versions of the standard. Between 1970 and 1972, for example, the head injury criterion changed from 80 g's, 3 milliseconds to 67 g's, 3 milliseconds to 70 g's, 3 milliseconds to a new measurement, the Head Severity Index, to a related but different measurement, the Head Injury Criterion. Maximum acceptable loads on the femur changed during the same period from 1,200 to 1,400 to 1,700 pounds.

Other changes to the rule reflected changing conceptions on the part of the NHTSA as to the feasibility of passive protection for both the front and rear seating positions, and in all three crash testing modes--frontal, lateral, and rollover. For example, the May 1970 NPRM proposed requiring, after January 1973, passive protection for all seating positions to be tested in all three crash modes. A November 1970 modification proposed delaying rear seat passive protection and front seat rollover passive protection until July 1974. The rule of March 1971 delayed until 1975 not only rear seat passive protection, but front seat rollover and lateral passive protection. It should be added that the rule which will become effective for all passenger cars in September 1983 does not require rear seat passive protection or front seat lateral or rollover passive protection. ^{44/}

The NHTSA is to be commended for conducting a rulemaking responsive to public comment. The meetings and conferences of 1969 and 1970, as well as the use of an initial ANPRM, indicated the agency's willingness to present its proposal for review and to collect needed data from industry or others. However, an appropriate sense of balance between initial background work and solicitation

^{43/} Case History of FMVSS 208, p. 15.

^{44/} Passive protection for the front seat occupants in the lateral and rollover crash modes is offered as an option by the standard.

of public comment is needed both to establish the credibility of a proposal and to generate the most meaningful response. In the case of the initial rulemaking associated with FMVSS 208, this balance was not present. The virtue of soliciting public comment was soon dispelled in the uncertainty and confusion generated by continual changes to the rule. As early as September 1970, responses filed in the docket expressed concern over the difficulty of commenting meaningfully on modifications which themselves were likely to be modified in the future. ^{45/}

Numerous potential difficulties with air bag systems had been described in the earliest stages of the development of FMVSS 208. Some of these difficulties, such as the effects of deployment pressure and driver reaction to inadvertent deployment of the air bag, were investigated and for the most part resolved relatively early. Other issues, however, proved more difficult to dispose of, and several are still being debated today. The correlation of dummy and human response, the effectiveness of air bags in angular impact, possible hazards to vehicle occupants from air bag deployment (accidental or otherwise), and problems for out-of-position passengers, particularly children, were all issues raised at the 1968 meeting between the NHTSA Director and automobile industry representatives. Respondents to notices continued to point out these problems in later meetings and in comments filed in the docket. As rulemaking progressed, they expressed increasing doubt that these issues could be resolved by the effective dates of the rule.

A variety of sources called attention to problems related to FMVSS 208. The automobile industry repeatedly emphasized the importance of the inadequacy (acknowledged by the NHTSA) of the testing dummy. The RECAT study done in 1972 for the Office of Science and Technology raised the issue of potential hazards of air bags, the lack of real world data, and the absence in the standard of a reliability requirement. ^{46/} Finally, an NHTSA analyst in a 1971 report on FMVSS 208 safety benefits cited a number of problems he felt were significant: that the barrier crash test required by the standard was not representative of real-world crashes; that because of evasive maneuvers and successive impacts, occupants in real crashes were not likely to be perfectly positioned in the vehicle as specified in the standard; and that psychological reactions to safety standards could produce unforeseen reactions to the standards. ^{47/} It appears, however, that there was no internal coordination within the NHTSA which directed these issues to Research and Development or other offices for either resolution or future consideration.

^{45/} Ibid., p. 18. Modification to the rule did not stop with the final rule of March 1971. Between July 1971 and November 1972, for example, 16 additional notices were published proposing or adopting further changes. Furthermore, amendment has continued until recently. In November 1978, the agency issued an amendment dealing with emergency release mechanisms for passive belt systems, a subject first raised in a notice of July 1971.

^{46/} RECAT is the acronym for the Ad Hoc Committee on the Cumulative Regulatory Effects on the Cost of Automobile Transportation. The Committee's report was prepared for the Office of Science and Technology which advised and assisted the President in insuring that science and technology were being used in the interests of the general welfare.

^{47/} Conrad Cooke, "Safety Benefits of the Occupant Crash Protection Standard," NHTSA, January 1971.

Some issues have thus been raised over and over during the standard's 10-year history, and the NHTSA has not been able to demonstrate convincingly that they are resolved. The out-of-position issue is perhaps the clearest example. Noted as a potential problem in 1969, 1970, and 1971, the issue was raised again in a 1976 report on the NHTSA's National Crash Severity Study; 48/ it was addressed in the 1977 decision on FMVSS 208 by DOT Secretary Brock Adams (see p. 23); and it was raised as a potential problem in 1979 by both the General Accounting Office report on passive restraints 49/ and by GM after some recent testing.

The Safety Board's reason for underlining problems associated with FMVSS 208 which have been raised in the course of the standard's history is not to suggest that they were or are insurmountable difficulties. In fact, late in 1979, GM announced that it no longer felt the out-of-position child to be a problem for its air bag system. Rather, the Safety Board's purpose is to demonstrate the inadequate foundation for the rulemaking process associated with FMVSS 208. The NHTSA insisted on proceeding with its rulemaking without answers to persistently raised questions. While some issues were resolved relatively early, others were not. The Safety Board does not expect that all problems must be resolved by the NHTSA prior to rulemaking. But the Safety Board does believe that, in the case of FMVSS 208, much of the controversy stirred by the standard has resulted from decisions to mandate passive restraints in the face of continuing or reoccurring questions not convincingly resolved by concrete research or testing results.

One of the most important early milestones in the history of FMVSS 208, and that of the NHTSA as well, was the judicial review of the standard in *Chrysler Corporation vs. Department of Transportation*. Responding to the final rule of March 1971, Chrysler, later joined by Ford, American Motors, Jeep, and the Automobile Importers of America, challenged FMVSS 208 in the Sixth Circuit Court of Appeals. The Court ruled on the case in December 1972. 50/ The Court supported the NHTSA's arguments that it

... is empowered to issue safety standards which require improvements in existing technology or which require the development of new technology, and it is not limited to issuing standards based solely on devices already fully developed. 51/

In addition, the Court held that many of the particular developmental problems cited by the petitioners had been resolved, and it complimented the agency on the flexibility of its rulemaking. However, the Court delayed the implementation of the standard, ruling that "the record supports the conclusions that the test procedures and the test device specified by Standard 208 are not objective. . . ." 52/ The Court declared that the NHTSA must specify in the standard

48/ Charles J. Kahane et. al., "The National Crash Severity Study," *Proceedings, the 6th International Congress of Experimental Safety Vehicles*, 1976, p. 500-501.

49/ "Passive Restraints for Automobile Occupants--A Close Look," U.S. General Accounting Office, July 27, 1979.

50/ *Chrysler Corporation v. Department of Transportation*, 472 F. 2d 659 (6th Cir. 1972).

51/ *Ibid.*, at 673.

52/ *Ibid.*, at 676.

reliable test procedures and testing devices which allow automobile manufacturers to produce "identical results when test conditions are exactly duplicated..."^{53/} Also, the Court held that the agency must give special consideration to sports cars and convertibles.

The results of the Chrysler case were far-reaching. On the one hand, in finding the testing procedure and test device inadequate and in sending the standard back to the agency for revision, the Court caused the first of what would prove to be a long series of delays in the rule's effective date. On the other hand, the case affirmed the NHTSA's authority to require technological advance concerning safety in the automobile industry. This was the foundation of the agency's position that its responsibilities in research and development lie in

the development of test method and equipment for use in the motor vehicle safety standards, [and in] the determination of the feasibility and performance capability of design and equipment concepts that are likely to be used to meet present and future motor vehicle safety standards. ^{54/}

As a result of this position, the NHTSA conducts its safety standard research and development program on the premise that it need demonstrate only that one technological solution is "feasible" and that research past the "feasibility" stage is the responsibility of industry.

The advantages of this approach are clear, given the NHTSA's limited resources and the need to provide direction for the automobile industry in safety research. However, the Board believes that it is not a necessary corollary that the NHTSA has no responsibility for sound problem identification, consideration of alternatives, and adequate research to support in detail the promulgation of a rule. In some cases, this may require far more effort than in others. In any case, the Court ruling defined only NHTSA's minimum responsibility in research which the agency is free to exceed as circumstances require and its budget allows.

Not all circumstances surrounding the development of FMVSS 208 could have been foreseen or controlled by the NHTSA. In 1972, the agency amended the standard to include an ignition interlock system ^{55/} as a third option for the interim period August 1973 to August 1975. ^{56/} It appears that this rulemaking resulted largely from political pressure on the NHTSA from within the Executive Branch. In 1974, during debate on the interlock in the House of Representatives, Representative John E. Moss gave the following explanation of the origins of the regulation:

^{53/} Ibid., at 676.

^{54/} NHTSA letter to the National Transportation Safety Board on January 7, 1980.

^{55/} An arrangement by which the engine cannot be started unless the seatbelts are engaged.

^{56/} Docket 69-7; Notice 16; 37 FR 3911. See Case History of FMVSS 208, pp. 40-42.

The interlock was brought about over the objections of the Department of Transportation as a result of the visit of the presidents of two of the major manufacturers of automobiles with the President of the United States, and at a subsequent meeting attended by Mr. John Ehrlichman, Mr. Robert Flanagan, and another White House aide, the order was issued to the Department of Transportation to go along with the interlock rather than the alternative system which the Department of Transportation had under study as an intermediate device. 57/

This explanation was also described in a 1976 House Subcommittee report entitled "Federal Regulation and Regulatory Reform," 58/ and the NHTSA has confirmed the political circumstances surrounding the interlock rulemaking in a letter to the Safety Board of September 7, 1979.

Because it was the option most easily complied with, 59/ virtually all automobile models introduced in the fall of 1973 were equipped with an ignition interlock system. Belt use in the interlock era increased significantly, but public resentment of the system caused Congress to pass legislation in October 1974 prohibiting interlock systems, and the option was eliminated immediately from FMVSS 208 by the NHTSA. At the same time, Congress amended the Safety Act of 1966 to require that any occupant crash protection standard be reviewed by both Houses of Congress where a concurrent resolution of disapproval could be passed. This provision would later lead to Congressional review of Secretary Adams' decision on FMVSS 208 in the fall of 1977.

The NHTSA contends that the interlock controversy marked the end of Ford's previous support of air bags, as well as a substantial decline in GM's previously strong support. 60/ Instead of producing 150,000 air bag-equipped vehicles in model year 1973, GM eventually produced less than 11,000 between 1973 and 1976. In addition, it has been alleged that GM made no effort to promote or encourage the sale of these air bag-equipped vehicles. 61/ GM officials have argued that the oil embargo of 1973 severely reduced the demand for large-sized cars, those in which air bags were to be installed, and that it could not sell more than the 11,000 it did. Whether the interlock controversy alone can be said to have caused the GM shift in direction away from air bags is unclear. The purpose of this report is not served by further investigation in this area. Regulation will continue to be affected by political, social, and economic events, particularly when rulemaking as far-reaching and significant as FMVSS 208 is involved. In order to minimize delay and controversy, it is imperative that the NHTSA carefully pursue initial rulemaking steps in order to create the strongest possible base for its proposals.

57/ Congressional Record, House of Representatives, August 12, 1974, p. 27821.

58/ Report by the Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, U.S. House of Representatives, 94th Congress, 2d Session, October 1976, pp. 187 and 188.

59/ The alternatives were full passive protection and front seat, frontal crash passive protection, plus lap belt.

60/ NHTSA letter to the National Transportation Safety Board, September 7, 1979.

61/ See for example, Albert R. Karr, "Saga of the Air Bag. . ." The Wall Street Journal, November 11, 1976.

Much argument concerning FMVSS 208 focused on estimated costs and benefits of the regulation. An early NHTSA estimate predicted that over 23,000 lives could be saved by the proposed standard. ^{62/} Apparently using this figure, NHTSA officials testifying before Congress in 1970 stated that 20,000 lives would be saved annually by the proposed FMVSS 208. However, this estimate was based on the potential of the standard as it might be developed in the future; it assumed seatbelts and air bags in all vehicles, and 100 percent usage of the belts as well as 100 percent effectiveness of the air bags, up to 60 mph. In January 1971, 2 months before the final complete rule was issued, the agency published its first detailed benefit study. ^{63/} The NHTSA analyst, assuming 100 percent implementation of the standard as it stood as of October 1970, concluded that 5,720 lives could be saved per year. While in 1971 a cost/benefit analysis was not required to accompany a proposed rule, this first study was done well into the rulemaking process. It was thus clearly not a part of the initial decisionmaking concerning FMVSS 208.

A second benefit analysis of FMVSS 208 was published in August 1974 while the interlock option was in effect. ^{64/} The report estimated lives saved by the interlock-belt option at between 5,320 and 9,170. Estimated safety benefits for the proposed air bag/lapbelt system were reported as between 13,300 to 18,700 lives per year. This estimate was revised in December 1974 to reflect public comment challenging several assumptions upon which the estimates were based, as well as the Congressional ban on, and NHTSA elimination of, interlock systems as an option in the standard. This amended estimate predicted 11,600 lives would be saved by an air bag and lap-belt combination. Another set of estimates was made 2 years later as part of the rulemaking initiated by DOT Secretary William Coleman (see p. 22). These considered various restraint system combinations and varying usage rates. For example, the airbag and lapbelt (full front) were estimated to reduce fatalities by 11,200; airbag and lapbelt (driver only) by 9,200.

Other estimates of airbag effectiveness varied widely. For example, the following estimates were made in 1974 and 1975 for lives to be saved by the airbag/lapbelt combination: GM--2,700; Economics and Science Planning--3,000; Ford--3,600; NHTSA--8,900; DeLorean Corporation--19,000. ^{65/} However, a 1977 report on restraint system effectiveness estimates by the House Subcommittee on Consumer Protection and Finance found that "the differences among various studies are less remarkable than their similarities." The study concluded,

^{62/} Proceedings, NHTSB Program Priorities Seminar, Vol. 4, Crash Survivability. Appendix A - Pay-Off Estimates.

^{63/} Conrad Cooke, op. cit.

^{64/} "Analysis of Effects of Proposed Changes to Passenger Car Requirements of FMVSS 208," NHTSA, August 1974.

^{65/} Hearing before the Subcommittee on Oversight and Investigations of Committee on Interstate and Foreign Commerce, 94th Congress, 2d Session, Vol. IV, Regulatory Reform, February 27, 1976, p. 486.

When realistic assumptions are made about the potential usage rates for the present active restraint systems, virtually all studies show a substantially greater effectiveness for both passive belts and air bags in saving lives and preventing injuries. While particular studies diverge widely in their estimates of the absolute effectiveness of given restraint systems . . . the greater relative effectiveness of passive restraints is clearly borne out. 66/

Much of the argument concerning benefit estimates has continued because a number of the basic assumptions necessary to make benefit estimates are themselves subject to considerable argument. Seatbelt usage rates, for example, have consistently been a source of debate, as well as the extent to which these rates could be improved. A percentage of passive belts are likely to be disconnected by vehicle owners and occupants, though exactly what percentage is unknown. The effectiveness of the standard's lap belt/air bag option is dependent on the lap belt usage rate for its effectiveness in lateral and rollover crashes. Finally, the overall effectiveness of the standard is dependent on the mix of different systems on the road--air bags, passive belts, and, for many years after the effective date of the standard, manual belts. All will be subject to differing usage and disconnect rates, as well as providing somewhat different degrees of protection in different types of crashes.

However, the major cause of the uncertainty concerning safety benefit estimates has been the absence, or, since about 1975, the inadequate amount, of real-world data. Earlier estimates, such as those of 1971 and 1974, were based entirely on laboratory testing and engineering judgment. Argument surrounding benefit estimates, therefore, often became reduced to debate on the degree to which that testing and engineering judgment reflected real-world crash conditions. In the NHTSA's first safety benefit report in 1971, the analyst raised these issues. He cited factors which could reduce the effectiveness of air bags, pointing out that the standard assumed an ideal set of circumstances--occupants perfectly positioned, and head-on, barrier crashes--which reflect real-world conditions to an unknown degree.

Because of the need for accident data to resolve the debate about air bag effectiveness, the first air bag-equipped vehicles were closely monitored. However, less than 12,000 such vehicles were produced between 1972 and 1976, a number too small to produce statistically valid results. Consequently, debate has continued concerning the meaning of the limited performance data which have been collected. By early 1976, four fatalities had occurred in air bag-equipped cars. One analyst emphasized this statistic and concluded that it called into question the effectiveness of the system. 67/ Another analyst, however, compared the accident experience of the air bag-equipped vehicles with a corresponding sample of non-air bag-equipped cars, and tentatively found that the restraint system reduced fatalities and serious injury by approximately 40 to 50 percent. 68/

66/ Report of the Subcommittee on Consumer Protection and Finance of the House Committee on Interstate and Foreign Commerce, 95th Congress, 1st Session, "The Department of Transportation Automobile Passive Restraint Rule," October 1977, p. 8.

67/ Charles Kahane, "Statistical Analysis of Air Bag Deaths," NHTSA, April 9, 1976.

68/ Conrad Cooke, "Fatality Rate Comparison, With and Without Air Bags," NHTSA, February 14, 1979; "Injury and Fatality Rates, With and Without Air Bags," NHTSA, March 28, 1979.

The cost of air bags has also been a source of controversy. During the standard's early years, no detailed estimates of cost to the consumer were made. A cost/benefit study accompanying Secretary Coleman's review of FMVSS 208 in 1976 estimated full-front coverage at \$190; this figure was revised 6 months later to \$97. Secretary Adams' decision in 1977 compared DOT estimates for full-front air bag protection with those of automakers: DOT--\$141 (July 1977); GM--\$246 (June 1977); Ford--\$422 (October 1976). Additional debate on costs has centered on potential savings on insurance premiums for owners of vehicles equipped with air bags. Estimates of air bag costs differ because they are based on various accounting systems and, most important, on approximations of volume of units. With the probable use of a large number of passive belt systems to meet the requirements of FMVSS 208, costs of individual air bag systems will likely increase, but it is unclear exactly how much. The General Accounting Office report of July 1979--"Passive Restraints for Automobile Occupants--A Closer Look"--examined cost estimates and concluded that the NHTSA's \$112 air bag cost estimate did not reflect increased costs that will come with lower production of the system (because of probable increased use of passive belts).

Safety benefit and cost estimates are management aids which should be used particularly in the initial stages of problem identification to assist in the decisionmaking process. In the case of FMVSS 208, such estimates have served more as justification for decisions already made. The safety benefit estimates which have been made during the development of FMVSS 208 have generally supported the potential safety benefits of the standard. Nonetheless, they are estimates and predictions of performance rather than descriptions of it, and only a detailed evaluation of the effect of the standard after it has been implemented will finally confirm the effectiveness of passive restraint.

The controversy surrounding FMVSS 208 in 1975 and 1976 caused Secretary Coleman to begin a major review of the standard. In response to an initial, internal request for comment, Coleman's Assistant Secretary for Systems Development and Technology reported that he felt the Department had neither adequate field test data related to FMVSS 208 nor sufficient engineering data in some areas, including barrier test data for side and angular front collisions. In June 1976, Secretary Coleman then published an NPRM in which he announced to the public his desire to reopen discussion on FMVSS 208, and suggested five alternative courses of action.^{69/} In addition, a public meeting was held in August 1976. Secretary Coleman's review resulted in a decision, announced in December 1976, which marked a major change of direction for the regulation.

Secretary Coleman rejected the five alternatives suggested in the June 1976 NPRM, including mandatory passive restraints. Instead, he decided to conduct a large-scale demonstration program to exhibit the effectiveness of passive restraints. This strategy had been previously suggested by Ford at a May 1975 public meeting, and in a report by the Council on Wage and Price Stability. Secretary Coleman's decision was primarily directed at what he believed to be the need to demonstrate to the public at large the effectiveness of air bags in real-world situations. His program, he felt, would help generate consumer demand for passive restraints to which the industry could respond. He hoped that, in effect, a demonstration program would reduce the need, or at least the urgency of the need, for a Federal regulation which in the past had engendered so much controversy.

^{69/} OST Docket 44; Notice 76-8; 41 FR 24070.

Secretary Coleman's rationale for his decision differed in several important respects from the NHTSA's traditional thinking on FMVSS 208. Rather than basing his position on technical issues, Secretary Coleman sought to deal directly with the indisputable fact that the standard was surrounded by controversy. He wanted, before regulating, to test the system in the real world, believing that broad-based public support for the technology behind the regulation was necessary if it was to be effective. Secretary Coleman's particular plan may have depended too heavily on industry cooperation and support; however, the concept of a demonstration program is an important one. Had such a demonstration program been successfully undertaken early in the history of FMVSS 208, useful information concerning air bag performance could have been acquired. Even today, adequate real-world performance data are not available.

Secretary Coleman's plan lacked any significant chance of success because it was presented during his final days as Secretary of Transportation. The unusual rulemaking history of FMVSS 208, however, continued as decisionmaking on the standard remained at the Secretary's level. Even as Secretary Coleman was negotiating contracts with automobile manufacturers in January 1977, the new Secretary-designate, Brock Adams, was announcing his intention to review Coleman's decision. Secretary Adams appointed a review committee, which included NHTSA and DOT officials, as well as other individuals. In-depth evaluation of available data was undertaken in several areas, including effectiveness, costs, side effects of air bags, and leadtime considerations. After another public meeting and a review of his committee's findings, Secretary Adams issued a final rule in June 1977.^{70/} This version of the standard, except in minor details, is the standard in place today which will become effective for some passenger cars in September 1981 and for all passenger cars in September 1983.

Secretary Adams reversed Coleman's decision, setting forth his arguments in a lengthy explanation. Reflecting an NHTSA perspective evident since FMVSS 208's earliest history, Secretary Adams expressed an urgent need for mandatory passive restraint. He argued that Secretary Coleman's plan would have resulted in a 5- to 8-year delay in regulation. He did not share Secretary Coleman's concern that FMVSS 208 would generate consumer resistance such as that which had characterized the interlock ruling. He felt consumers would support mandatory passive restraints and that, in light of the expected trend toward smaller cars, the need for passive protection was even more urgent. Technical issues, he concluded, had been sufficiently resolved to support rulemaking.

The Safety Board supported mandatory passive restraints in letters to the Secretary of Transportation prior to both the Coleman and Adams decisions.^{71/} With respect to the latter, the Board also urged more consideration of passive belts which had received little attention at the April 1977 public hearing.

^{70/} Docket 74-14; Notice 10; 42 FR 34289.

^{71/} NTSB letters of December 5, 1976, and May 13, 1977.

FMVSS 208 as issued by Secretary Adams did not go unchallenged. In the fall of 1977, committees in both Houses of Congress conducted further hearings, in accordance with the Safety Act of 1966 as amended in 1974. Both committee reports strongly endorsed the standard, concluding that it was well supported by the evidence and would provide increased protection to front-seat occupants. ^{72/} Moreover, the standard successfully withstood a second judicial test, a double-pronged challenge from the Pacific Legal Foundation, which wanted the standard overturned, and from Ralph Nader and Public Citizen, which wanted it implemented sooner. The Court ruled in favor of the DOT in February 1979, dismissing the arguments of both petitioners and affirming the Secretary's ruling. ^{73/}

In both the Coleman and Adams decisions concerning FMVSS 208, the Secretary of Transportation directly exercised authority which he would normally delegate to the Administrator of the NHTSA. Secretary Coleman clearly explained his exercise of authority in the NPRM of June 1976:

The Secretary's regulations, delegating authority to NHTSA, exist to ensure that routine business can be conducted without the Secretary's personal participation and to ensure administrative finality at the NHTSA level when the Secretary so desires, but do not operate to divest the Secretary of any authority. The fact that, on this occasion, I am personally deciding whether, and if so how, to amend FMVSS 208, does not therefore necessitate a formal revocation of NHTSA's authority in this matter. (41 FR 24070)

It should be pointed out that the course of the rulemaking process was not disrupted in that data associated with FMVSS 208 and its history were reviewed, NPRM's were issued, and public meetings held. NHTSA officials, furthermore, continued to do most of the work associated with the rulemaking. Thus, the Coleman and Adams decisions should not be construed as departures from regulatory procedures. They do indicate, however, the level of controversy and debate which surrounded the standard and made the exercise of authority at the Secretary's level necessary in the view of the two Secretaries.

Passive protection required by FMVSS 208 as it currently stands will be phased in beginning with large-size passenger cars in September 1981. After September 1983, all passenger cars will be required to provide passive protection for front-seat passengers. It has long been recognized that the standard's history will not end with its effective date. Air bag and passive belt technology will then be tried for the first time in a large population of vehicles in real-world

^{72/} See Report of the Subcommittee on Consumer Protection and Finance of the Committee of Interstate and Foreign Commerce, U.S. House of Representatives, 95th Congress, 1st Session; "The Department of Transportation Automobile Passive Restraint Rule," October 1977; Report of the Committee on Commerce, Science, and Transportation, U.S. Senate, 95th Congress, 1st Session, "Automobile Crash Protection," October 7, 1977.

^{73/} Pacific Legal Foundation v. Department of Transportation, 593 F. 2d. 1338 (D.C. Cir., 1979), cert. denied 100 S. Ct. 57 (1979).

circumstances; it has been emphasized numerous times that careful monitoring of that experience will be imperative. Without a detailed and thorough evaluation of FMVSS 208, particularly during the first years of its implementation, its safety effectiveness will not accurately be known. Secretary Adams' task force which reviewed the FMVSS 208 evidence prior to his decision emphasized the need for monitoring implementation of the regulation. The Court in the Pacific Legal Foundation case also pointed out the need for the DOT to "monitor closely the road experience with any standard based on experimental data and make needed modification."^{74/} The Court noted the NHTSA's failure to do so, and the consequent problems, in the case of FMVSS 121.

In March 1979 the Safety Board published an analysis of the NHTSA's passive restraint evaluation program in response to a request by the Senate Committee on Appropriations. The Board concluded that while the NHTSA was committed to evaluating the standard, its evaluation program was unorganized. The Board recommended development and publication of a formal evaluation plan to manage the evaluation activities related to FMVSS 208.

In October 1979 the NHTSA published, and requested comment on, a detailed evaluation plan for FMVSS 208. The plan described 30 questions concerning the standard, which addressed such issues as the effectiveness of automatic restraint systems, public attitudes, characteristics of malfunctions which might occur, and costs of the system.

The NHTSA is to be commended for organizing its evaluation plans for FMVSS 208 and publishing them for public comment. As the Safety Board had recommended, the NHTSA expanded the objectives of the evaluation beyond simple fatality and injury reduction effectiveness and rates of automatic belt usage. Exploration of these additional issues will provide information of significant use in evaluating the impact and benefits of this standard. The projected semiannual public reports will prove particularly beneficial to the public by enabling it to follow closely the results of the evaluation as they develop. The Safety Board's suggestions for further improvements to the plan, in such areas as data collection, the priority assigned certain issues to be studied, and public education efforts, are detailed in a separate response to the NHTSA docket, which is appended to this report.

As part of its evaluation of NHTSA rulemaking associated with FMVSS 208, the Safety Board reviewed the agency's research and development effort in support of the standard. Although it has been stated previously, it bears repeating that the Safety Board's purpose in reviewing the testing program related to FMVSS 208 has never been to evaluate the technical feasibility of the standard or of particular devices associated with the standard. The Safety Board's concern, rather, has been with how decisions have been made to undertake particular research and development, and how research has been integrated to support rulemaking. These two processes have proven extremely difficult to evaluate, however, largely because the Board has encountered major difficulties in obtaining a basic level of information necessary to address these issues. The NHTSA was unable to provide

^{74/} Pacific Legal Foundation v. Department of Transportation, at 1344.

such essential data as an accurate year-by-year account of funding related to FMVSS 208, a comprehensive list of contracts associated with occupant crash protection testing, and general descriptive statistics on the testing program, such as how many tests of what kind were conducted at what times and by whom. Consequently, an independent effort was undertaken by the Board to develop the information for use in this evaluation. The task proved far more involved, complex, and time-consuming than had been initially anticipated. ^{75/}

The first task was a review of funding associated with FMVSS 208. It was believed that this would provide an initial measure of types of testing done and would indicate where emphasis had been placed. Budget and contract data were collected and tabulated for the years 1967 to 1978. While good cooperation was received from the NHTSA in completing this project, the process of data acquisition did present difficulties. Financial records were retained by the NHTSA in a variety of locations, such as the Technical Reference Library, the Contracts and Procurements Office, and the Office of the Associate Administrator for Research and Development. Information from these offices did not always agree on funding levels for the same contracts. Also, comparisons between various sources were difficult due to changes in program codes over the years. These problems resulted in the risk of some double counting of funds. Overall, there existed no clear, comprehensive record of total financial expenditures by the NHTSA regarding occupant restraint systems testing.

Review of the funding data collected showed that between 1967 and 1978, a total of \$30,612,000 was spent on programs "directly applicable" to FMVSS 208--research in which the direct purpose was designing, developing, promoting, or educating people about FMVSS 208-related programs. Expenditures of directly related funds by year and by restraint type are shown in Table 1. It should be pointed out that the figures in Table 1 differ in varying degrees from testimony given by the NHTSA before the House Appropriations Committee at different times during the 1970's. However, because of variations in accounting procedures, clear comparisons between the two cannot readily be made.

In addition to reviewing funding the Safety Board looked at the NHTSA's crash testing program regarding FMVSS 208. The first step in this task was to identify and locate all contract reports containing data on testing of vehicle restraint systems. This effort began by constructing a comprehensive list of all applicable contracts, then locating the test reports. The NHTSA did not have such a list, nor did it have a centralized or easily retrievable collection of crash testing research related to FMVSS 208. Bibliographies which were located turned out to be inaccurate or incomplete, and while abstracts of many testing contracts were available, some were not. Considerable time was spent, therefore, simply constructing a list of applicable reports, then in locating copies of these documents.

^{75/} The Safety Board contracted with Cromack Engineering Associates, Inc., (CEA) of Tempe, Arizona, to assist in the completion of this task (NTSB contract 79001 "A Program to Provide Engineering Services in Evaluating the National Highway Traffic Safety Administration's Active and Passive Restraint Program").

Table 1.—Expenditure of Funds Directly Applicable to FMVSS 208
By Year and Restraint Type 1/

| | Active Belt | Passive Belt | Inflatable Restraint | Other <u>2/</u> | Total |
|-------|----------------|-----------------|-------------------------|-----------------|--------------|
| 1967 | 872 | 0 | 0 | 92 | 964 |
| 1968 | 605 | 0 | 0 | 100 | 705 |
| 1969 | 794 | 0 | 0 | 165 | 959 |
| 1970 | 965 | 0 | 919 | 213 | 2,097 |
| 1971 | 773 | 0 | 1,258 | 490 | 2,521 |
| 1972 | 640 | 37 | 1,027 | 296 | 2,002 |
| 1973 | 390 | 0 | 946 | 684 | 2,021 |
| 1974 | 750 | 0 | 1,165 | 1,034 | 2,950 |
| 1975 | 326 | 0 | 988 | 976 | 2,290 |
| 1976 | 206 | 0 | 1,246 | 1,588 | 3,041 |
| 1977 | 704 | 269 | 827 | 3,210 | 5,012 |
| 1978 | <u>412</u> | <u>431</u> | <u>1,495</u> | <u>3,706</u> | <u>6,046</u> |
| Total | 7,437 | 737 | 9,871 | 12,554 | 30,612 |

1/ Funding is given in thousands of dollars. Funds for each year and restraint type include funds expended in the following types of programs: Tests or experimental evaluation; data collection; analysis or analytic evaluation; materials supplies or equipment; information or education; and surveys.

2/ This column designates funding which included two or more of the other restraint types, but which could not be broken down specifically into separate restraint type categories.

NHTSA staff were helpful in both identifying and collecting these reports. However, the staff member assigned to aid the search for these reports did so in addition to his normal duties, and had a limited amount of time to spend assisting the Safety Board staff. The identification and location of the reports thus became a major, time-consuming task which extended from January to July 1979. After nearly 6 months, the NHTSA Associate Administrator with whom the Safety Board staff had been working verified that as far as he knew, the Board had a copy of all research reports concerned with occupant crash protection testing. 76/ These reports contained results of nearly 2,600 systems tests done between 1969 and 1979.

The review shows that between 1969 and 1979, the NHTSA sponsored extensive testing of occupant restraint systems--in particular, air bags. Of nearly 2,600 system tests, over 1,600 were of air bag systems, including both driver and passenger, both with and without belts. Some 388 tests involved active belts, 111 involved passive belts, 164 involved a relatively unpublicized restraint--the inflatable belt, and 71 tests were done with no restraint (see Table 2). Testing was done with some human volunteers, cadavers, and animals, but was accomplished for the most part with testing dummies (over 1,400 tests used a 50th percentile adult anthropomorphic dummy). Tests were overwhelmingly sled tests (1,999), and most of the testing was done at a 12 o'clock impact direction (2,179). The right-front seat occupant received greatest attention--1,708 tests--with 721 performed on the driver position. Some 2,390 tests were conducted with occupants in the normally seated position, 195 tests were performed on out-of-position occupants.

Table 2 shows restraint system testing by year. The chart reveals extensive and consistent testing of air bags, particularly on the passenger side, without belts. Much less air bag testing has been done for both driver and passenger with a lap belt (a current requirement of the standard which will begin to go into effect in 1981). The table also shows consistent, though less extensive, testing with lap-shoulder belt combinations, and no restraint. Testing on passive belt systems and advanced concept active restraints has been intermittent and much less extensive than air bag or lap-shoulder belt testing. The NHTSA explained the reasons for their passive belt testing in a letter to the Safety Board:

Since the primary difference between manual and automatic belts is in their convenience and not their crash performance, we do not believe that a major automatic belt test program will be needed except for purposes of standards enforcement. Since Volkswagen introduced its automatic belt with a knee bolster several years ago, it has submitted extensive test data to the agency demonstrating its performance both in the FMVSS 208 tests and in many non-standard test conditions. This material is in the docket. Thus, the agency did not find it necessary to test the Volkswagen automatic belt extensively. 77/

76/ NHTSA letter to the NTSB, August 9, 1979.

77/ NHTSA letter to the NTSB, January 7, 1980.

Table 2.—Chronological Summary of Tests Conducted by Type of Restraint ^{1/}

| <u>Type of Restraint</u> | <u>Year</u> | | | | | | | | | | | <u>Total</u> |
|--|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|
| | <u>69</u> | <u>70</u> | <u>71</u> | <u>72</u> | <u>73</u> | <u>74</u> | <u>75</u> | <u>76</u> | <u>77</u> | <u>78</u> | <u>79</u> | |
| No Restraint | | | 2 | 5 | 7 | 9 | 25 | 2 | 15 | 6 | | 71 |
| Lap Belt, Standard Production | 27 | 33 | 2 | 3 | | | | 4 | 5 | | | 74 |
| Lap Shoulder Belt, Standard Production | | 11 | 9 | 18 | 10 | 13 | 18 | 20 | 70 | 83 | 2 | 254 |
| Active Restraint, Advanced Concept | | | 15 | 11 | | | | 12 | 22 | | | 60 |
| Passive Belt | | | | 32 | | | 79 | | | | | 111 |
| Air Bag, Driver Without Belt | | | 5 | 22 | 10 | 209 | 12 | 11 | 66 | | | 335 |
| Air Bag, Driver With Belt | | 5 | | | | | | | | | | 5 |
| Air Bag, Passenger Without Belt | 8 | 98 | 114 | 305 | 40 | 173 | 122 | 136 | 85 | 106 | | 1,187 |
| Air Bag, Passenger With Belt | 37 | 70 | 5 | | | | | | | | | 112 |
| Inflatable Belt | | | | 12 | | 10 | 123 | | 19 | | | 164 |
| Child Restraint | 110 | 1 | | | | | | | | | | 111 |
| Other | — | — | | 48 | | 48 | — | — | — | | | 96 |
| Total | 182 | 217 | 153 | 456 | 67 | 462 | 379 | 185 | 282 | 195 | 2 | 2,580 |

^{1/} The numbers used in this may exceed the number of crash tests because more than one system/ position may have been tested in any given crash test.

It should be pointed out that restraint technology, particularly in the case of the air bag, changed considerably over the years. Thus the numbers in Table 2 do not necessarily represent testing on systems of the same design or type within the broad generic categories used in the chart. In addition, after approximately 1974, much testing, particularly of air bag systems, was done at speeds of 35 to 50 mph, well above the 30-mph specification in the standard. Finally, it should be added that crash testing done by industry or others is not reflected in the chart.

The Safety Board's initial review of crash testing related to FMVSS 208 raised questions regarding both the agency's decisionmaking process with regard to research and development and the relationship of research and development to rulemaking. For instance, how was research planned so as to support the rulemaking process? Were summaries or reviews of overall testing results made at particular points in time? How were results of testing used to plan further work? How were decisions made as to when sufficient testing had been done in certain areas, or when a system's ability to meet FMVSS 208 specifications had been adequately proven?

In order to deal with these questions, Safety Board staff provided a copy of the overview of the NHTSA's occupant crash testing to the NHTSA for review, and met with agency technical staff and the NHTSA Administrator's special assistant. At this meeting, the NHTSA staff indicated that no overall review of FMVSS 208 research had ever been done and that, as far as was known, the Board's investigation was the first such review of the FMVSS 208 research program. The agency officials further stated that decisions concerning the direction and adequacy of testing were made on an ad hoc basis by engineers and other officials involved at the time. Such decisions were made based on engineering judgment and were not documented in the public record. Past knowledge and decisions, rather, were contained in what was described as the "institutional memory"--that is, the collective working knowledge and experience of those NHTSA staff members associated with the development of the standard. It appears that no long-term, comprehensive research plan was developed regarding FMVSS 208, nor was year-by-year planning based on a systematic review of research results achieved to date. NHTSA staff members indicated that formal, written planning concerning the standard was done annually for budget purposes and was a "1-year at a time planned process which reacted to the dynamics of a changing world." The NHTSA Administrator has described FMVSS 208 research as "10 1-year programs." The Board concludes, therefore, that the planning of research concerning FMVSS 208 during the development of the standard has not been organized or systematic. It has not followed a well constructed plan, but has proceeded from year to year, reacting to problems which have arisen.

The Safety Board strongly believes that the decisionmaking process which guides research and development and ties it to rulemaking must be documented. Periodic reviews which summarize the results of past research, which indicate the direction for further work, and which specify how the research supports rulemaking should be included in the docket where they are open to public scrutiny. The NHTSA should establish the frequency with which such reviews are to be prepared, as well as a reasonable level of detail for such reports. The Safety Board does not question the need for engineering judgment in decisionmaking by those actively involved in testing programs, nor does the Board believe the NHTSA must document every decision made. However, conversation between contract managers

and engineers and "institutional memory" alone are not adequate planning and managerial processes for a public agency; they have led to unnecessary confusion and debate about exactly what research the agency has actually accomplished and what the basis for rulemaking decisions has been. The failure to undertake any comprehensive review of research on FMVSS 208 over the years has resulted in questioners being sent to a voluminous docket to seek information. The combination of the enormous volume of material and the agency's failure to review and summarize its own work has created difficulties in getting answers to legitimate questions. It is imperative that the basis for decisions and planning based on those decisions be explicit and documented. This is not merely a formal exercise. It serves as a management tool to coordinate the concerns of both engineers and policy makers, and it also functions to involve the public in knowledgeable debate about proposed regulation.

The NHTSA has recently described FMVSS 208 as "revolutionary" and in important respects it does differ from all of the agency's other safety standards. It attempts to set performance criteria not for vehicle components but directly for the vehicle occupant by means of injury criteria measured on an anthropomorphic dummy. Because the standard is complex and has been modified over time, it may be helpful to describe exactly what the standard currently requires.

Passive (now referred to as "automatic") protection is mandated only for passenger cars, beginning in September 1981 for automobiles with a wheel base greater than 114 inches. All passenger cars are to provide front seat passive protection by September 1983. Occupant restraint requirements for trucks, buses, and multipurpose passenger vehicles are also specified in the rule, but passive restraint is not mandated.

The standard describes passive protection requirements in terms of crash testing and injury criteria which are measured on testing devices. Maximum permissible levels of force are specified for the head, chest, and femur of anthropomorphic dummies, and, in addition, an anti-ejection requirement is described. The rule also details three types of crash tests--a frontal (head-on or any angle up to + 30°) barrier test at 30 mph; a lateral, moving-barrier test at 20 mph; and a rollover test. For each crash test, different combinations of the four injury criteria are specified: the frontal test requires head, chest, femur and ejection criteria to be met; the lateral test requires head and chest criteria to be met; the rollover test requires only the anti-ejection requirement to be met.

The occupant protection required for passenger cars by FMVSS 208 is as follows: (1) all front-seat passengers are to be afforded passive protection tested in the frontal crash mode; (2) all rear-seat passengers are to be provided seatbelts; and (3) (a) front-seat passengers are to be provided passive protection tested in the lateral and rollover crash modes, or (b) front-seat passengers are to be provided active seatbelts which, in conjunction with passive restraints, meet the requirements of a frontal crash test.

Two important points concerning the final two options should be noted. First, the two options (3)(a) and (3)(b) do not require, as demonstrated through testing, equivalent protection (i.e., in lateral and rollover crashes). Option (3)(a) requires protection to be tested in lateral and rollover crashes, while option (3)(b) deals only with a frontal crash test. Second, the standard does not require the active seatbelt

specified in option (3)(b) to be tested, by itself, in any crash mode at all. Thus, under the requirements of the standard, the seatbelt cannot be said to offer protection which is tested in either rollover or lateral crashes. The NHTSA has repeatedly asserted that the current FMVSS 208 is designed as a frontal crash standard only. This may indeed be the case, particularly since it appears that automobile manufacturers will choose option 3(b). However, it is not immediately evident in the wording of the rule, and it is evident only if one acknowledges that option (3)(a) is one which cannot or will not be met, and that option (3)(b) does not specifically offer rollover or lateral protection.

PART II:

ANALYSIS OF NHTSA'S CURRENT RULEMAKING PROCESS

The analysis of the rulemaking process associated with FMVSS's 121 and 208 indicate the problems which arise when rulemaking is undertaken without sufficient problem identification, consideration of alternatives, and evaluation. The evaluation in this section of the report will analyze the NHTSA's current rulemaking efforts to examine the changes that have taken place and the efforts that are being made to achieve a more orderly rulemaking procedure.

The most important criterion which was used to evaluate the current rulemaking process of the NHTSA was whether that process is conducive to obtaining the optimum safety benefit. In many cases it is extremely difficult to demonstrate a clear relationship between the procedural steps of rulemaking and lives saved or injuries avoided. However, the Safety Board believes that improved procedures in rulemaking will increase the safety benefit of the NHTSA's standards.

The second criterion used to evaluate the rulemaking process of the NHTSA was the specific mandates of its own procedural requirements. These mandates are contained in the Safety Act of 1966, ^{78/} the Administrative Procedures Act (APA), ^{79/} internal NHTSA Orders such as Order 800-1, ^{80/} Executive Order 12044, and the Department of Transportation Regulatory Policies and Procedures (DOT Order). These constitute the formal procedures by which the NHTSA is currently required to conduct its safety standard rulemaking. The expected content of documents such as the Rulemaking Support Papers, cost/benefit analyses, "signature packages," work plans, Regulatory Analyses, and evaluation plans is specified in detail by these orders.

^{78/} National Traffic and Motor Vehicle Safety Act of 1966, P.L. 89-563. September 9, 1966; 15 U.S.C. 1381 et. seq.

^{79/} Sections 551, et. seq. and 701, et. seq. of Title 5, Government Organization and Employees.

^{80/} NHTSA Order 800-1, February 2, 1977, is the basic procedural order for rulemaking procedures. See Case History of Current Rulemaking, p. 10.

Examination of the rulemaking activity in which the NHTSA is presently engaged illustrates that the prescribed process and the actual process of rulemaking are not always identical. NHTSA officials interviewed by the Safety Board were candid in acknowledging that Order 800-1 is not followed to the letter. However, officials did indicate that they believe that the spirit of the order is followed. ^{81/}

For purposes of this analysis, the rulemaking process has been separated into discrete sections. In actual practice the various activities overlap or occur in different order than presented here. This subdivision of the process, however, follows the general sections of the NHTSA's own internal procedural orders.

Identification and Definition of the Safety Problem

The Safety Board strongly endorses the careful and clear definition of the safety problem for every proposed safety standard. It is extremely important that the regulatory agency clearly understand exactly what problem the standard is designed to ameliorate. Otherwise, the design of the standard, the specific requirements placed on the industry, and the impact of the standard may be misdirected. At best, this will result in ineffective regulations; at worst, it may result in an actual derogation of safety.

The NHTSA has a clearly stated mandate to adequately analyze and state the need for any safety standard. The Safety Act of 1966 requires the NHTSA to consider "relevant available motor vehicle safety data. . ." when prescribing safety standards. The Act authorizes the NHTSA to conduct research and data collection to determine the relationship between vehicle performance characteristics and accident causation or injury reduction. The NHTSA Order 800-1 requires the preparation of a Rulemaking Support Paper to include: "problem identification, magnitude, target group characteristics, type of vehicle or vehicle equipment affected—expressed in quantitative terms to the extent possible. . . ." In addition, the DOT Regulatory Policy and Procedures (DOT Order) states that "a regulation should not be issued or continue in effect unless it is based on a well-defined need to address a specific problem."

The implementation of these requirements is not an easy task. Under the best of situations, the NHTSA should be able to describe the safety problem in minute detail including such factors as the segment of the population affected, the specifics of the accident scenarios (such as when, where, and how), and the exact source of the safety problem. The detailed data for these determinations often do not exist. Therefore, approximations of that information are used in the actual practice of defining the safety problem.

^{81/} Case History of Current Rulemaking, p. 24.

Certain aspects of mass data collection systems restrict their usefulness in defining the problems. The accident data systems such as the National Crash Severity Study (NCSS) and the National Accident Sampling System (NASS) do not contain the technical detail required to fully describe each safety problem observed. The special studies of the NASS program may provide the level of detail necessary, but that system is not yet fully operational. Effective use of this source of information will require careful advance planning and the commitment of adequate resources. ^{82/}

Another factor which influences the level of detail required is the type of safety standard under consideration. Generically, safety standards have been defined as either crash avoidance or crashworthiness standards.

Crash avoidance standards are designed to reduce the likelihood of the occurrence of an accident and typically cover such areas as lighting and braking requirements. By the very nature of such standards, the specific definition of the problem is difficult. The number of accidents which have occurred, but could possibly have been avoided by a safety standard, can be estimated. However, the analyst can only make "considered judgments" on the cause of accidents. In addition, the exact sequence of events that led to the accident is often not known in precise detail. Typically, the NHTSA has relied on the use of "considered judgment" or "engineering judgment" to supplement insufficient data for crash avoidance standards.

Crashworthiness standards, on the other hand, are aimed at reducing the consequences of crashes, regardless of their cause. That premise makes statistical definition of the type of accidents much more straightforward. The use of detailed investigations of representatively selected samples of accidents can yield valuable information for the clear definition of crashworthiness-related safety problems.

In those areas where detailed information on the specific safety problem is unavailable, the NHTSA should proceed with caution. Under some conditions the use of "intuitive rulemaking" can offset data deficiencies. Few reasonable people would claim that effective brakes are unrelated to motor vehicle safety on the grounds that accident data do not exist to prove conclusively the value of such devices. It is intuitively obvious that brakes can help to avoid accidents. However, when the NHTSA substitutes intuitive judgment for data analysis, it runs the risk of being unable to justify the specifics of a standard's requirements. This in turn could lead to overregulation, underregulation, the introduction of a new safety problem, or at least the waste of very limited NHTSA and public resources. FMVSS 121, the air brake system standard, is a prime example of this point. FMVSS 121 was a purely intuitive standard with no comprehensive attempt made to analyze the safety problem until after the standard was implemented. The NHTSA's inability to show conclusive evidence of the benefits of the standard led to the Court's decision to overturn the standard. The Safety Board's analysis of the FMVSS 121 rulemaking process reveals that the inability to show a clear impact of the standard is directly related to the lack of problem definition in the earliest stages of the development of the standard.

^{82/} See "Safety Effectiveness Evaluation of the NHTSA's National Accident Sampling System," March 2, 1978 (NTSB-SEE-78-1).

A review of the recent rulemaking of the NHTSA shows that current efforts in problem identification are varied. For example, a proposal for High-Mounted Rear Lights under FMVSS 103 is perhaps the best example of problem identification in the crash avoidance area. ^{83/} The study of a fleet of taxicabs with prototype high-mounted rear light systems has shown measurable differences in accident rates as compared to the standard arrangement. It is important to note that the study was really a benefit analysis and not purely a problem identification effort. The NHTSA used the assumption that if safety benefits are demonstrable then there must have been a safety problem. While indirect, it probably is the best example the NHTSA has of analytical problem identification in the area of crash avoidance. Also concerning FMVSS 108, the NHTSA has an in-house effort planned to review accident files for rear-end accidents.

The plans for developing FMVSS 130, Heavy Duty Vehicle Brake Systems, show marked improvement over the procedures used in promulgating its predecessor, FMVSS 121. The NHTSA plans for developing this standard have demonstrated to the public the difficulties of problem definition in this area. By issuing a proposed outline for the standard, the NHTSA will be inviting public participation in forming the standard. ^{84/} This appears to be the best way of avoiding the pitfalls of intuitive rulemaking as practiced in the development of FMVSS 121.

The new rulemaking initiative on Low Tire Pressure Warning Indicators, however, appears to depend on the results of a limited study which estimated that low tire inflation pressures are causally involved in 1.4 percent of traffic accidents on city streets and rural roads. This figure is then extrapolated to estimate the safety benefits of the standard and, implicitly, the safety problem it is expected to overcome. ^{85/} The NHTSA staff interviewed stated that the real benefits of the proposal lie in the area of fuel economy and less emphasis has been placed on the analysis of the safety problem. The analysis contained in the cost/benefit study supports this view. It remains to be seen whether the NHTSA will make further efforts to define the safety problem before initiating rulemaking action.

The Pedestrian Initial Impact Protection rulemaking exemplifies careful definition of a specific problem. The NHTSA has conducted extensive research, including accident investigation, on the crash forces involved in pedestrian/vehicle collisions and their effects on pedestrian injury. That effort has resulted in a comprehensive problem identification by the agency. ^{86/}

In summary, the NHTSA staff is aware of the difficulties and the importance of accurately defining the safety problem. It has been working toward improved techniques of data collection for both crash avoidance and crashworthiness standards. The head of the Crash Avoidance Division has assigned a staff analyst to attempt to find "new and innovative ways of analyzing the data." Typically, only indirect measures of the parameters of a problem have been available in the area of crash avoidance. However, the analysis of High-Mounted Rear Light systems show that better problem identification is possible in the area of crash avoidance.

^{83/} Case History of Current Rulemaking, p. 27.

^{84/} Ibid., p. 30.

^{85/} Ibid., p. 32.

^{86/} Ibid. p. 40.

Consideration of Alternative Approaches

Effective rulemaking should consider all practical approaches to solving a problem. The histories of both FMVSS 121 and FMVSS 208 illustrate the difficulties which arise when the NHTSA has selected one approach to the exclusion of adequate testing and evaluation of other alternatives. In the area of safety regulation, the Safety Board believes that an optimum balance of safety effectiveness and minimal burden must be sought. This calls for a careful analysis of possible alternative solutions.

Moreover, there is a clear mandate for the NHTSA to consider various alternatives. The NHTSA internal orders, Executive Order 12044, and the DOT Order, all specify that alternatives to rulemaking actions must be considered. The DOT Order states "Regulations should be feasible, be developed along with alternatives, and not impose unnecessary burdens." NHTSA Order 890-1 requires that the reasons for a selected approach be listed in the Rulemaking Support Paper (RSP) with details of what consideration was given to alternatives and what consideration was given to technological feasibility.

For "significant regulations,"^{87/} the NHTSA Administrator is required to submit a statement to the Secretary of DOT for concurrence. The DOT Order requires the Administrator to determine in that statement that "alternate approaches have been considered and the least burdensome of the acceptable alternatives have been chosen." That requirement implies that a number of alternatives must be considered and that they must be evaluated for both their acceptability and their burden on the regulated public.^{88/}

The Safety Act of 1966 and subsequent court decisions do not require the NHTSA to consider alternatives. The Safety Act of 1966 requires only that proposed standards be "reasonable, practicable and appropriate. . ." and that the NHTSA issue performance standards instead of design standards to allow manufacturers to be innovative in automotive design. The courts have also ruled that the NHTSA is authorized to issue safety standards which require the development of new technology, and that it is not limited to issuing standards based solely on devices already fully developed.^{89/}

These factors have all combined to discourage the full evaluation of alternative approaches to regulations. During interviews with the NHTSA staff and senior management it became clear that there is not a full commitment to the early and careful consideration of alternatives. Because the NHTSA issues performance standards, agency officials stated that the development and testing of alternatives is the responsibility of the industry. According to this rationale, the NHTSA responsibility is limited to showing that a standard is practicable, and that it can be accomplished by developing one countermeasure.

^{87/} "Significant regulations" are defined in the DOT Order and require specific rulemaking analyses. See Case History of Current Rule. . . , pp. 17 and 19.

^{88/} Case History of Current Rulemaking, p. 19.

^{89/} See discussion of Chrysler v. DOT in section on analysis of FMVSS 208, p. 17.

Another philosophy expressed by the NHTSA staff is that alternative approaches are considered in the very preliminary stages of the rulemaking and then only the "most promising" approach is tested in detail. This is done in an effort to use limited testing funds judiciously.

The past rulemaking of the NHTSA did not give much consideration to different types of alternatives. FMVSS 121 was drafted with antilock devices in mind. Alternative solutions were not seriously considered and were certainly not carefully evaluated. Air bag systems have dominated the testing program of the NHTSA for FMVSS 208, Occupant Crash Protection. Even the most widely used other technical alternative, passive belts, has been tested by the NHTSA only minimally.

The current rulemaking of the NHTSA reflects some of these same trends. The Pedestrian Initial Impact Protection initiative has identified only one technical approach. Furthermore, internal NHTSA staff comments which have suggested another approach have received little consideration. Successive versions of the draft RSP have not contained detailed analysis of approaches other than the selected soft-front-end solution. 90/

In other rulemaking actions the NHTSA has paid more attention to alternatives. For example, the Low Tire Pressure Warning Indicator initiative has considered four possible alternatives which are a mix of technical approaches and regulatory approaches. 91/ In addition, the research program for High-Mounted Rear Lights has evaluated four technical approaches (including a no-change option) and arrived at a preliminary comparison of benefits. 92/

After reviewing the internal documents, such as RSP's, that are used by the NHTSA to develop standards, a point of concern has been identified. In most cases, serious consideration of alternatives is first undertaken at the Regulatory Analysis/Evaluation Stage. 93/ Too often these alternatives are not developed as an active part of the decisionmaking process, but appear to have been suggested by the Office of Plans and Programs to satisfy the requirements of Executive Order 12044. This is illustrated by two points. The internal comments of the NHTSA on draft RSP's and Regulatory Analyses frequently question whether different approaches had been considered by the Office of Rulemaking. Secondly, the Research and Development Plan typically lists only one technical approach which will be tested in support of a particular rulemaking initiative.

Unfortunately, the consideration of alternatives at the Regulatory Analysis stage is frequently not effective. Typically, data have not been collected nor have tests been performed on the alternative approaches suggested by the analyst from the Office of Plans and Programs. As a result, that office is not prepared to defend its suggested approaches in any informal meeting to discuss the draft documents. A review of internal NHTSA comments on RSP's for FMVSS 203/204 and the Pedestrian Initial Impact Protection proposal show that alternatives have been rejected by the Office of Rulemaking because the office objecting had

90/ Case History of Current Rulemaking, p. 40.

91/ Ibid., p. 32.

92/ Ibid., p. 27.

93/ Ibid., p. 18.

insufficient data. ^{94/} Too often the end result is that rough estimates are used to justify the wisdom of the originally selected approach. This also results in the NHTSA being able only to estimate the impact of its selected approach and not necessarily the one that industry will use to meet the standard.

It must be remembered that these analyses are performed before the NPRM stage and the NHTSA is free, of course, to consider alternatives suggested by the public. However, by advancing only one fully developed approach, and little or no information on the other alternatives considered, the NHTSA gives the appearance of being unwilling to accept other approaches. In addition, this procedure shifts the burden of developing and testing viable alternatives to the public rather than the regulator as specified in the DOT Order. If, however, the NHTSA developed multiple approaches, along with detailed supportive data for each viable approach, the resulting performance standard could be more readily explained and justified.

Internal Planning Process

Before the advent of the Five-Year Rulemaking Plan process, ^{95/} the first step in initiating rulemaking was the preparation of a Project Plan Description (PPD). This document was an outline of the major points of the proposed action, including the major elements of the RSP. This outline was then circulated to the senior management of the NHTSA for comment and final approval by the Administrator. That process was repeated in a yearly review of the PPD's. It was during this yearly review of the PPD's that the NHTSA senior management allocated agency resources to particular rulemaking projects. Interviews with the NHTSA staff have indicated that the PPD process has been discontinued and replaced by the Five-Year Rulemaking Plan process. The NHTSA staff described the PPD's as "unmanageable" and stated that the Five-Year Rulemaking Plan process has been more effective in deciding program priorities.

Apparently, much of the decisionmaking process in current NHTSA rulemaking takes place in informal meetings to develop and revise the Five-Year Rulemaking Plan. At these informal meetings each of the potential rulemaking initiatives is discussed in detail and a priority of rulemaking action is established. In effect, the NHTSA uses these meetings to evaluate the relative merits of all of the proposed actions of the agency. Each proposed action is described as to the expected benefits, the level of resources needed to support it, and the types of countermeasures available.

Through a series of meetings, starting at the engineering staff level and progressing to the Administrator's level, the resources of the agency are allocated to the rulemaking actions with the highest expected benefits. This distribution is followed by documentation of resource needs in the Research and Development Plan.

^{94/} Ibid., pp. 35 and 40.

^{95/} The "Five-Year Plan for Motor Vehicle Safety and Fuel Economy Rulemaking" was published by the NHTSA in March 1978 and updated in April 1979. The plan contains the expected Rulemaking goals of the agency. See Case History of Current Rulemaking, p. 21.

The Five-Year Rulemaking Plan process does more than simply produce the published plan documents. In effect, the NHTSA has combined many steps of the rulemaking process into a managerial technique. The Five-Year Rulemaking Plan process has made it necessary for individual program managers to develop enough factual support for each initiative to compete with other program managers for resources. Typically those rulemaking initiatives with clearly defined objectives and well documented estimates of measurable benefits are the most successful in the competition for limited resources.

This selection process also considers a number of factors beyond the analytical data. The initiatives with high societal involvement are often given a higher priority than might be expected from a strictly analytical point of view. For example, an internal NHTSA cost/benefit analysis of the extension of FMVSS 302, Flammability of Interior Materials, to include schoolbuses does not appear to be a highly cost/beneficial project.^{96/} However, consideration of the public demand for safer schoolbuses has apparently accelerated that rulemaking schedule.

The Five-Year Rulemaking Plan process has been extremely successful in increasing communication between elements of the NHTSA. The NHTSA staff characterized the coordination between the Offices of Rulemaking and Research and Development as poor before the process was adopted. The planning process, however, in motivating both offices to consider jointly the goals of the agency and how to best reach those goals has made the research program more reflective of the rulemaking plan.

The process has also forced all of the program managers to evaluate the goal of each proposed rulemaking initiative and how it can best be accomplished. In this respect the planning process causes the NHTSA to consider both the identification of the problem and the potential of countermeasures when establishing the priority of initiatives. This also results in improved interaction and coordination of the actions of each of the NHTSA offices. The end result has been a documentation process which, while not detailing the decisionmaking process, does specify the planned actions of the NHTSA, how the agency expects the specific problems to be solved, what resources the NHTSA will need, and what benefits are expected.

Overall, the Five-Year Rulemaking Plan process has clearly improved the rulemaking process of the NHTSA.

Internal Preparation of a Standard

In the published Five-Year Rulemaking Plan, the NHTSA indicated that more detail would accompany each rulemaking action and that the priorities were established by the use of available data and "the considered judgment and analysis by the NHTSA high level technical staff and senior management."^{97/} The primary document for recording both the additional detail and those "considered judgments" is the RSP. The RSP is required by Order 800-1 and is required to contain enough information to support a legal defense if the standard were ever challenged. It is

^{96/} Case History of Current Rulemaking, p. 44.

^{97/} Ibid., p. 22.

required to detail the background, the need, the highlights of the rulemaking, the schedule, the reason for selecting the approach, the potential benefits and costs, the environmental impact, the potential reaction of others, the effect on other standards, and a proposed evaluation plan to measure the effectiveness of the rule. The RSP is to be updated continuously as the proposal progresses toward final rule.

The RSP is distributed for internal comment and forms the framework for much of the deliberation among elements of the NHTSA. It serves as a means of reviewing all of the preparatory information, from the initial research to the cost benefit analysis of the selected approach.

The fact that the RSP is a predecisional, internal document and, therefore, not released to the public, encourages open, frank participation by all of the Associate Administrators. The Safety Board staff reviewed numerous RSP's, as well as internal comments on the RSP's, and found a full and free flow of constructive criticism from all of the elements of the NHTSA.

It appears that one of the major benefits of the RSP is that it does generate a strong interaction among the offices of the NHTSA. The staffs of each of the Associate Administrators evaluate the RSP from a fresh point of view and openly question any portions of the document lacking in detail. In some cases, RSP's have been changed substantially as a result of this review process. In addition, the type of comments which have been made on RSP's indicate that most of the offices of the NHTSA feel free to offer comment on aspects outside their normal concern. For example, the Office of Chief Counsel has questioned the technical compatibility of the Pedestrian Initial Impact Protection proposal with other standards.^{98/} These questions are then required to be resolved by the Office of Rulemaking, or forwarded unresolved to the Administrator for a determination.

The quality of RSP's reviewed by the Safety Board staff was good. The cost/benefit studies which normally accompany the RSP are detailed and lay out expected costs and benefits along with the major assumptions. However, the analysis is generally prepared in detail only for the selected approach, with much less detail for other possible alternatives. It should be noted that Order 800-1 requires a statement of why the approach was selected over other alternatives but does not require detailed analysis of the major alternatives. Generally, the plan for evaluating the effectiveness of the proposed rule after it is issued lacks detail. Very little attention is given to that section of the RSP. For example, the only "plan" for the Low Tire Pressure Warning Indicator proposal was a sampling of tire pressures "some 5 years after the rule becomes effective."^{99/}

Other sections of the RSP are based on informal interaction between the NHTSA and industry. The evaluation of the required leadtime and potential reaction of interested parties tends to be based on the "considered judgment" of the safety standard engineer.

^{98/} Ibid., p. 41.

^{99/} Ibid., p. 33.

Another internal procedure is required at this stage of the rulemaking: the preparation of the draft Regulatory Analysis or Regulatory Evaluation (RA or RE). ^{100/} Regulatory Analyses are performed for "significant regulations," while Regulatory Evaluations are prepared for all others. These analyses are required by Executive Order 12044 and are similar to a cost/benefit analysis of a series of options. These analyses are prepared by the Office of Plans and Program and are placed in the public docket.

When Plans and Programs prepares these analyses it normally relies on the information contained in the RSP. The analyst preparing the RA or RE is required to offer different alternatives or propose others if none are contained in the RSP. The RA or RE are considered to be similar to each other in scope with the level of detail being the only important difference. Regulatory Analyses are performed for "significant regulations," while Regulatory Evaluations are prepared for all others.

As currently used, the RA/RE are not integral elements of the decision-making process. These analyses are not used to pick the selected approach but rather are prepared well after the approach has been selected. It is possible for the analyst in the Office of Plans and Programs to disagree with the selected approach and to force a reconsideration of the decision. In fact, that has happened in a number of cases. A review of the internal memoranda concerning the petitions for relief from FMVSS 108, Lamps, Reflective Devices, and Associated Equipment, shows the Office of Plans and Programs' active participation. However, the analyst preparing the RA/RE does not typically review all of the data available to the engineer in Rulemaking. Therefore, the analyst is less prepared to offer convincing alternatives for actual consideration. As a result, the RA/RE tend to rely on the assumption that the selected approach was the best that could have been chosen. Consequently, most of the value of this analytical procedure is lost.

It should be pointed out that the RA/RE are normally performed before an NPRM is issued and before the agency has decided on a final course of action. It may be possible that strong public comment can change the action to a less burdensome alternative; but, by performing analysis of the alternatives so late in the development of the standard, the public is given the task of proving that the selected approach is not "the least burdensome of the acceptable alternatives"

Public Involvement in the Development of Standards

The Safety Board fully endorses the active participation of the public in the safety standard rulemaking process. That involvement can be critical to the design, effective implementation, and public acceptance of safety regulations and consequently their ultimate safety benefit. The legislative history of the Safety Act of 1966 is clear (and fully consistent with the APA) in its intent that a wide segment of the highway community ^{101/} should be given an opportunity to

^{100/} Ibid., p. 17.

^{101/} The history specifies "manufacturers, distributors, and dealers of motor vehicles and motor vehicle equipment, public and private organizations, individuals engaged to a significant extent in the promotion or study of motor vehicle safety, and automobile insurance underwriters . . . , " 1966 U.S. Code Cong. and Adm. News, p. 2713 et seq.

participate. The legislative history goes so far as to require that, where appropriate, "a technical statement setting forth the data necessary to an evaluation of the standard by competent technical personnel..." should be published with each rule.

The internal NHTSA Orders call for the analysis of public comment when standards are developed. In addition, the NHTSA has been following a policy of offering financial assistance to persons desiring to make comments but who are economically unable to do so.

Executive Order 12044 states that regulations shall be developed through a process which ensures that "... opportunity exists for early participation and comment by other Federal agencies, State and local governments, businesses, organizations and individual members of the public..." The DOT Order goes on to list specific steps which should be followed to increase public participation.

Other than the reference in Executive Order 12044 for "early participation," the timing for public involvement is unspecified. The NHTSA, unlike many other regulatory agencies, has frequently used ANPRM's to solicit public comment in the past, as in the case of FMVSS 208. NHTSA staff members have also pointed out that proper timing of the ANPRM is essential to eliciting meaningful response. It is necessary that enough background work be done that the public have specific issues and questions to address.

The NHTSA has been soliciting more public involvement in recent years. The NHTSA sponsors bi-monthly industry meetings which have been valuable. Also, the plan for developing FMVSS 130, Heavy Duty Vehicle Brake Systems, is an example of where public participation will be sought in designing the standard. The upgrading of FMVSS 214, Side Impact Protection, is another good example of using an ANPRM to elicit early public participation in the drafting of the standard. In addition, a public meeting has been held to discuss with industry and others the NHTSA's work on the proposal to date.

Thus, it is clear that the NHTSA has actively sought to include the public in the rulemaking process. However, there are two additional actions which could strengthen the public's ability to offer meaningful comment. The first is illustrated by the actions currently underway involving FMVSS 130. The NHTSA has published an ANPRM soliciting comments on its long-range plans for heavy vehicle braking. The accompanying draft Regulatory Analysis, published with the ANPRM ^{102/} analyzed a wide range of problems associated with crash avoidance standards for public involvement. It clearly stated the tentative plans of the agency, the points of concern, the difficulty of quantifying benefits, and the agency's view of potential solutions. That document is a good example of how an agency can provide the public with a firm basis for offering meaningful comment. The draft Regulatory Analysis for FMVSS 130's long-range plans is an example of the type of information that the NHTSA could publish early in the rulemaking process to spark more meaningful public involvement.

^{102/} Case History of Current Rulemaking, p. 31.

The second improvement which could be made in the NHTSA's procedures involves the interrelationship of standards. For example, the Pedestrian Initial Impact Protection proposal is heavily dependent on the methods elected by manufacturers to comply with other standards, notably: FMVSS 208; the "Part 581" Bumper Standard; FMVSS 203/204, Steering Controls; and others. The RSP for this proposal originally made little mention of these other standards with the exception of the bumper standard. While the Office of Chief Counsel raised concern over the interrelation of some other standards, the final version of the RSP reviewed by the Safety Board staff showed little detailed consideration of other standards.^{103/} Another example of this interrelationship problem is seen in the rulemaking for FMVSS 203/204. Those standards repeatedly have been proposed for upgrading repeatedly since their issuance. Many modifications to FMVSS 204 have been delayed because of the interaction with FMVSS 212 and 219, which concern windshield performance. The delays encountered in implementing FMVSS 208 have caused associated delays in FMVSS 203/204.^{104/} In addition, during interviews with members of the industry and the research community, the Safety Board staff was told of the difficulty in preparing detailed responses to NPRM's when the specific criteria of highly interrelated standards are still very much unresolved.

Development of an Evaluation Program Plan

The Safety Board strongly endorses the timely preparation of detailed evaluation program plans for every safety standard. The evaluation program plan most clearly ties together the results of the problem identification, consideration of alternatives, and estimation of benefits. As such, it is a most important and critical final check on the regulatory process.

Unfortunately, the NHTSA, in spite of specific requirements in its own procedures does not appear to share the Safety Board's concern. Two internal NHTSA Orders specify the formulation of plans to measure the impact of proposed rules. Order 800-1 calls for a "proposed evaluation plan to measure the effectiveness of the rule after its promulgation" to be a part of the RSP. NHTSA Order 500-1, while generally not adhered to by the NHTSA staff, states, "No programs and projects will be undertaken without an evaluation plan . . ." and gives primary responsibility for the development of these plans to the Associate Administrator for Plans and Programs. The DOT Order requires the NHTSA Administrator to determine that "a plan for evaluating the regulation after its issuance has been developed" before final "significant regulations" are submitted for concurrence of the Secretary.

In actual practice, the NHTSA does not prepare detailed plans for the evaluation of its proposed rules. Evaluation program plans are done as an afterthought and definitely are not related to the measurement of changes in a well defined problem. FMVSS 208 has become an exception to the rule because of the urging of the Safety Board^{105/} and the GAO. The other plans reviewed by the Safety Board had a lack of detail that makes the chance of successful evaluation minimal. For the most part, this deficiency is directly related to the lack of definitive initial problem identification. Without such information the NHTSA is at a disadvantage in trying to predict exactly what the safety benefits are likely to be.

^{103/} Ibid., p. 41.

^{104/} Ibid., p. 36.

^{105/} See "Safety Effectiveness Evaluation of the NHTSA's Passive Restraint Evaluation Program," March 16, 1979 (NTSR-SEE-79-3).

FMVSS 221 clearly illustrates this point. Even in 1975 when an evaluation program was finally started, the NHTSA was left with only gross measurements of changes in heavy vehicle safety. Thus, the agency was unable to relate those changes to any specific aspects of the standard. Therefore, it became impossible to measure the effects of the standard independently of other influences.

The timing of an evaluation program plan is also critical. The plan should be completed and published before the standard is made final. The plan for an evaluation program most clearly shows the key elements the NHTSA expects to change because of the standard. Clear specification of the expected safety benefit reveals the purpose of the performance requirements. In addition, the formulation of a comprehensive evaluation program plan makes it necessary for the NHTSA to realistically appraise the purpose of its rulemaking and certainly forms a good final check on the quality of the proposed standard.

The evaluation program cannot be considered as an independent unit, unrelated to rulemaking. The evaluation of a standard is directly related to the identification of the specific safety problem, the expected costs, the implementation schedule, the required effectiveness and other impacts, and the expected levels of compliance.

Rulemaking requires a systems approach with many of the same elements of the problem being traced throughout the life of a standard. Ideally, the same data which defines the problem would be used to evaluate countermeasures; then to draft the standard; then to predict costs and benefits; and finally to measure effectiveness. Without such an approach, the NHTSA is left with the almost impossible task of sorting out the causes of benefits shown by the accident data after-the-fact.

Issuance and Maintenance of the Standard

After a standard is issued as a final rule, the NHTSA is required to monitor its effects. The DOT Order specifically calls for periodic reanalysis of regulations. It states that "a regulation should not be issued or continued in effect unless it is based on a well-defined need to address a specific problem." In addition, the Order states that a regulation should "respond to the circumstances that require it and should be modified or cancelled as those circumstances change." Nine specific guidelines are listed for identifying regulations which need review or possibly should be revoked. All of the guidelines call for monitoring the impact of a regulation after it is implemented and require a commitment to measure its effectiveness.

The Safety Board's study of several standards generally indicates that the NHTSA procedures for maintaining a standard after it has been issued are not clearly defined. The GAO report, 106/ praising the NHTSA evaluation techniques, was prepared before any standard had been evaluated and was based primarily on the NHTSA's plans to evaluate standards. Those plans, in the past, have relied on one-time evaluations of individual standards rather than a continuing effort to assess the longer term impact. The day-to-day monitoring of the effect of a

106/ "Evaluation of Programs in the Department of Transportation--An Assessment," Comptroller General of the United States, (PAD-79-13), April 3, 1979, p. 34.

standard is the joint responsibility of the Office of Plans and Programs and the appropriate engineer in Rulemaking assigned the duty of maintaining that standard. However, there appear to be no formal guidelines for the conduct of that monitoring function.

It does appear that the NHTSA supports the concept of measuring the effectiveness of its standard. However, once a standard becomes a final rule, the NHTSA's efforts at measuring actual effectiveness fall short of their full potential. A large part of this problem is related to the fact that evaluation program plans are generally unstructured. These plans have overlooked many of the possible sources of information available to the NHTSA. For example, compliance test results are not considered an integral part of the evaluation process. In most cases planning for compliance testing is not initiated until well after the effective date of a standard. This results in the NHTSA losing valuable information on what type of products are being introduced and how many in fact comply with the standard's requirements. Compliance testing by itself can not accurately measure the impact of a standard, but it can be used as a part of the evaluation mechanism. There is no indication that a role for the Office of Enforcement is being considered in monitoring the effectiveness of safety standards. The comments offered by that office on such documents as RSP's are restricted to the specific compliance test procedures and do not offer any analytical suggestions for monitoring the effectiveness of the standards.

Rulemaking regarding FMVSS 108, Lights, Reflective Devices, and Associated Equipment, best illustrates the NHTSA's efforts in maintaining a standard. This standard has been the subject of a continuing stream of petitions since it was first introduced in 1968. The NHTSA staff has indicated that the large number of petitions is a result of the nature of the standard. FMVSS 108 contains extensive, detailed requirements and is probably as close to a "design standard" as any that the NHTSA has issued. Reportedly, this is responsive to the needs of State enforcement personnel in checking vehicles on the road for compliance to lighting standards. However, the level of detail has resulted in the need for frequent revisions and amendment to FMVSS 108 as new lighting products are introduced to the market. Consequently, the NHTSA expends considerable staff-hours (3 staff-years for 6 years) just responding to the various requests for amendment. This is reportedly the largest staff requirement within the NHTSA for maintaining a standard. 107/

In spite of the large effort made by the NHTSA to maintain FMVSS 108, it is also a standard whose benefits the NHTSA staff stated it would have difficulty proving analytically.

In one case, an NHTSA review of the effect of a standard has obtained concrete results. FMVSS 214, Side Impact Protection, was recently reevaluated and its upgrading proposed. That reevaluation indicated new areas in which the standard might be beneficial. This has resulted in the NHTSA being better able to structure a careful research program to design a new standard to meet a specific safety problem. 108/ FMVSS 214 exemplifies the type of review that the NHTSA should undertake for all safety standards.

107/ Case History of Current Rulemaking, p. 25.

108/ Ibid., p. 37.

There is one other type of review of safety standards which has had its impact in the past—judicial review. The court cases involving both FMVSS 121 and FMVSS 208 are a clear indication that the public will resort to this review process if necessary. The results of those reviews have had a significant effect on the NHTSA rulemaking. But judicial review involves a heavy drain on the resources of both the NHTSA and the public. The Safety Board believes that careful, comprehensive rulemaking can greatly reduce the impetus for the public to seek relief in the courts.

PART III

CONCLUSIONS

The Safety Board appreciates the complexity of developing effective motor vehicle safety standards. Furthermore, the Board recognizes that it is much easier to evaluate the development of standards with the benefit of historical perspective than to actually manage the development of those standards. Nevertheless, the Board believes that the following conclusions developed from the evaluation provide valuable insight for the future:

FMVSS 121: Air Brake Systems

1. In the development of FMVSS 121, the NHTSA did not conduct research and data analysis to adequately define and document the types and causes of accidents the standard was intended to reduce.
2. The NHTSA did not develop a plan for evaluating the effectiveness of FMVSS 121 until after the standard was in effect and problems had begun to arise. The evaluation efforts which were initiated by the NHTSA failed to adequately assess the impact of the standard.
3. The NHTSA was prohibited by a court from enforcing the "no-wheel lockup" provision of FMVSS 121 because it could not demonstrate the safety benefits of the standard.

FMVSS 208: Occupant Crash Protection

4. FMVSS 208 has been an innovative standard in its attempt to establish criteria which directly relate vehicle performance to crash forces on the human body.
5. The genesis of FMVSS 208 was the NHTSA's concern about the high incidence of death and injury in motor vehicle crashes and the NHTSA's recognition of the enormous protective potential of occupant restraints.
6. FMVSS 208 was developed primarily to encourage adoption of air bags as passive restraints.
7. In the early stages of FMVSS 208, the automobile industry, as well as the NHTSA, supported the concept of air bags.

8. In developing FMVSS 208, the NHTSA actively sought advice from the public through Notices of Proposed Rulemaking and several public meetings.
9. The NHTSA has not, until recently, seriously considered technological alternatives to the air bag, particularly passive belts.
10. FMVSS 208 was initially drafted without adequate supporting data: problem identification was too general; test procedures were insufficiently developed; and the bases for some injury criteria were not well documented.
11. The NHTSA has never comprehensively reviewed and documented its overall Research and Development activity related to FMVSS 208.
12. The NHTSA's reliance on "institutional memory," and the failure to document and summarize its Research and Development activity make it difficult to determine how the Research and Development program was used to support the FMVSS 208 rulemaking process.
13. In response to a Safety Board recommendation, the NHTSA has developed a systematic plan for evaluating the effectiveness of FMVSS 208.

Current Rulemaking

14. Since 1977, major improvements in the NHTSA's rulemaking procedures have been implemented.
15. The Five-Year Rulemaking Plan has been an important part of the rulemaking procedure improvements.
16. Rulemaking Support Papers are a vital internal link in the documentation of the rulemaking process, and they generate open, frank discussion within the NHTSA.
17. The NHTSA is aware of the difficulties of adequately identifying and defining safety problems before beginning to draft standards and has improved its efforts in this area.
18. The staff and senior management of the NHTSA are not fully committed to the early and careful consideration of alternative technical solutions or regulatory approaches in rulemaking.
19. The consideration of alternatives required in the Regulatory Analysis phase of rulemaking is not properly integrated in the NHTSA decision-making process.
20. Early and careful consideration of alternatives is vital to meaningful rulemaking.

21. The NHTSA does not devote sufficient resources or attention to the development of coordinated evaluation program plans, particularly early in the standard development process.

General

22. In general, the NHTSA conducts its safety standard Research and Development program on the premise that the agency need demonstrate only that one technological solution is "feasible" and that research past the "feasibility" stage is the sole responsibility of industry.
23. The definition of "feasibility" used by the NHTSA in connection with Research and Development is unclear.

RECOMMENDATIONS

The Safety Board recognizes that many improvements in the NHTSA's rulemaking process have taken place during the past 3 years. Nevertheless, the Board believes that additional improvements can be made by implementing the following recommendations:

To the Secretary of Transportation:

Review the "Department of Transportation Regulatory Policies and Procedures" in light of the findings of this report concerning the consideration of regulatory alternatives, to determine whether modifications are needed and applicable on a DOT-wide basis, particularly in respect to --

- (a) Whether the "Regulatory Policies" should specify that more than one alternative should be considered and evaluated;
- (b) Whether the "Regulatory Policies" should specify that all significant and practicable alternatives be fully supported by sufficient data to allow a comprehensive analysis and comparison during the Regulatory Analysis; and
- (c) Whether the "Regulatory Policies" should require that all significant and practicable alternatives be fully discussed in public notices with specific reference to the supporting data and documents.

(Class II, Priority Action) (H-80-28)

To the National Highway Traffic Safety Administration:

Revise NHTSA Order 800-1 to require that the precise nature and magnitude of the safety problem to be affected by a proposed Federal Motor Vehicle Safety Standard be defined no later than the Notice of Proposed Rulemaking stage, and that data analysis, research reports, demonstrations, and other information in support of the problem identification be included or specifically referred to in the Notice; and

that the data be of the level of detail "necessary to an evaluation of the standard by competent technical personnel," as called for in the legislative history of the Safety Act of 1966. (Class II, Priority Action) (H-80-29)

Revise NHTSA Order 800-1 to require that, in the development of proposed Federal Motor Vehicle Safety Standards, detailed consideration be given to and analysis be made of all significant and practicable alternative approaches, and that they be described in the Rulemaking Support Paper, with specific references to research reports or demonstrations which detail the preliminary evaluation of those alternatives. (Class II, Priority Action) (H-80-30)

Revise NHTSA Order 800-1 to require that Rulemaking Support Papers contain detailed plans for the evaluation of safety standards after they are issued; the revised Order 800-1 should give specific guidelines for such postimplementation evaluation plans. (Class II, Priority Action) (H-80-31)

Revise NHTSA Order 800-1 to specifically revoke the procedures formerly followed for Project Plan Descriptions and to require that the development of the Five-Year Plan for Motor Vehicle Safety and Fuel Economy Rulemaking be a continuing process. (Class II, Priority Action) (H-80-32)

Revise NHTSA Order 800-1 to require that the issuance of, and comment periods, for Notices of Proposed Rulemaking be coordinated with other pending Notices of Proposed Rulemaking on related safety standards. (Class II, Priority Action) (H-80-33)

Establish written procedures which will formalize the safety standard research and development decisionmaking process to require:

- (a) At least annual review of the Research and Development program, including summaries and analyses of work accomplished on specific issues;
 - (b) documentation of specific decisions on the direction of future research, including decisions not to proceed in a given direction, or to explore a given issue; and
 - (c) that these documents be made available to the public.
- (Class II, Priority Action) (H-80-34)

Develop and implement a system for the collection, storage, and rapid retrieval of research reports and related material derived from or related to the safety standard research and development program for use by the NHTSA and other interested parties. (Class II, Priority Action) (H-80-35)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PATRICIA A. GOLDMAN
Member

/s/ G. H. PATRICK BURSLEY
Member

April 15, 1980

ELWOOD T. DRIVER, Vice Chairman, did not participate.

JAMES B. KING, Chairman, filed a concurring statement:

I concur in the adoption of the report, but depart somewhat from its implications concerning the development of FMVSS 121. The report's analysis states that NHTSA's initial development of the standard was deficient in failing to define adequately the problem which FMVSS was designed to correct, i.e., what types of heavy vehicle accidents it was designed to prevent. In light of the facts as they appeared when the original Notices were issued, FMVSS 121 was adequately defined.

The standard as proposed had two objectives: (1) to reduce the disparity in stopping distances between trucks and automobiles; and (2) to reduce such hazards as skidding and jackknifing. There was no disagreement that these improvements would reduce losses to others on the highway, but the amount of life saving was not known from accident data. The report implies that, lacking such data, problem identification was inadequate.

At the time the standard was being contemplated, it was known: (1) in accidents between trucks and automobiles, deaths and injuries were disproportionately borne by the occupants of the smaller vehicles; (2) truck stopping distances were longer than those of automobiles; and (3) truck braking technology lagged behind that of other transportation modes. Also at this time legislation was pending to permit increased truck sizes and weights, which would further add to the risks to other highway users. Taken together, these circumstances establish the need for an improved braking standard.

Agencies can often see what kind of improvements are needed before being able to prove the precise size of the safety gain. The increase in truck size and weight provided both an opportunity and a justification for improving truck braking. Trucking operators stood to gain the economic benefits of bigger, heavier trucks while imposing greater risks on other highway users. The attempt by

NHTSA and its predecessors to link the two was a rational regulatory strategy. The report implies that FMVSS 121 was not clearly defined because it did not identify by cause the type of accidents it was trying to prevent. Had NHTSA deferred improving heavy truck braking until a sufficient number of accidents "proved" the need for a standard, I suspect that the Safety Board would have been among the first to rebuke the agency for its inaction. I know I would have.

In addition, I believe there is strong evidence that the trucking industry itself had agreed to link increases in size and weight to improved braking, and that the industry supported these improvements as technically practicable. At the time when the size and weight legislation was under consideration by the Congress, the trucking industry made statements offering improvements in truck safety if industry requests for size and weight increases were granted. For example, on July 9, 1969, at hearings before the House Committee on Public Works concerning size and weight increases, the ATA testified and sponsored additional testimony from truck brake manufacturers and a vehicle manufacturer. After some discussion of differences in stopping capability between trucks and passenger cars, the ATA representative indicated that the purpose of the presentations was to describe "what we plan to do in the future, given the opportunity to have a vehicle with advanced features in it." One manufacturer said that he had just gone into production with an antilock brake, described its simplicity, and said it was reliable. The other described three different ways to obtain shorter stopping distances, saying that antilock brakes "combined with faster response, will enable the truck engineer to design for decelerations limited only by the tire-to-road coefficient of friction." A truck manufacturer stated that "additional safety can be built into new vehicle concepts incorporating the proposed increases in overall width and length." The ATA representative concluded: "the technology for tomorrow's truck is readily at hand, and what is needed now is the legislative decision to move forward." In this climate, I cannot fault the decision to proceed.

To be sure, in retrospect it is possible to recognize deficiencies in the manner in which the standard was later developed. Later problems did occur in developing brake systems to meet the standard. But I do not believe these problems should necessarily have been foreseen at the time of the decision to move forward, and therefore I cannot criticize the initial decision as failing to identify adequately the problem it was addressing.

GLOSSARY

Administrative Procedure Act (APA) - specifies procedural requirements for the publication of rulemaking in the Federal Register. The APA also grants interested persons the right to petition for the issuance, amendment, or repeal of a rule.

Advance Notice of Proposed Rulemaking (ANPRM) - a formal public notification, published in the Federal Register, announcing that the NHTSA intends to establish a rule. Generally, an ANPRM requests information to assist in the development of a particular proposal and does not propose details of a rule.

Antilock devices - devices (generally electronic computer modules), that sense the impending skidding of a wheel during braking and automatically modulate air pressure to the brake chamber to keep the wheel rolling. These devices have been known by a variety of terms, including: "Skid control," "antiskid," "adaptive braking," and others.

Docket - an NHTSA file containing comments submitted by interested parties regarding a proposed rule. Comments may come from automobile makers, insurance companies, medical organizations, safety groups, consumer groups, legislators, government agencies, other organizations, or individual citizens. In addition, the NHTSA includes in the docket material concerning the proposed rulemaking which it wishes to make public.

Executive Order 12044 - The NHTSA rulemaking process has been substantially affected by Executive Order (E.O.) 12044, "Improving Government Regulations." E.O. 12044 was issued by President Carter on March 23, 1978, and stated the following policy:

Regulations shall be as simple and clear as possible. They shall achieve legislative goals effectively and efficiently. They shall not impose unnecessary burdens on the economy, on individuals, on public or private organizations, or on State and local governments.

Exploratory rulemaking - covers those categories of activities where a safety problem has been identified but additional research and engineering analyses are necessary to explore feasible solutions.

Final rule - after issuing an NPRM and considering the comments submitted to the docket, the NHTSA may issue a final rule or it may decide further changes are necessary and issue another proposal, or it may terminate the rulemaking. A final rule mandates the standard and establishes a date when the requirements of the regulation become effective.

Five-Year Rulemaking Plan - a plan published first in March 1978 and revised and updated in April 1979 that focuses the NHTSA's resources on approximately 40 rulemaking projects.

Near-term rulemaking - a category of rulemaking action where it is clear that regulation is a reasonable way to solve fairly well-defined problems.

NHTSA - an agency within the Department of Transportation (DOT). It was first established in April 1967 as the National Highway Safety Bureau (NHSB) to carry out the provisions of the National Traffic and Motor Vehicle Safety Act of 1966 and certain provisions of the National Highway Safety Act of 1966. Administrative action of the Secretary of Transportation placed that Bureau within the Federal Highway Administration (FHWA). On March 20, 1970, the Secretary separated the Bureau from the FHWA and established it as one of the administrations of the Department, reporting directly to the Secretary. The Highway Safety Act of 1970 confirmed this action, renaming the agency the National Highway Traffic Safety Administration.

NHTSA Order 800-1 - describes in detail the procedures by which rules are to be developed, including a 17-step process of coordination and review. The Order established the policy that all rulemaking activity was to be based on "sound problem identification and data analysis techniques giving due regard to societal costs." It also initiated a policy of at least yearly review of ongoing rulemaking for a "revalidation of initial assumptions, data analysis, costs and benefits."

Notice of Proposed Rulemaking (NPRM) - a formal notice proposing a rule in detail and explaining the agency's reasoning for the rulemaking. The purpose of both an ANPRM and an NPRM is to afford the interested public an opportunity to comment on a proposed rule.

Passive or Automatic Restraint - an occupant restraint system which requires no action other than would be required if the protective system were not present in the vehicle.

Petition - a procedure by which, within 30 days after a rule is published, any individual or organization may request that the NHTSA reconsider a rule by filing a "petition for reconsideration." Organizations or individual may also petition the agency to initiate rulemaking or request exemptions from standards or parts of standards. The NHTSA may either grant or deny requests, but it is required to consider all petitions.

Regulatory Evaluation or Regulatory Analysis - A paper prepared by NHTSA's Office of Plans and Programs after a Rulemaking Support Paper has been written, to assess the effects of a proposed rulemaking, in particular to evaluate the costs and benefits associated with the proposal and alternatives to it. This analysis becomes part of the public docket when a notice, either an ANPRM or NPRM, is published.

DOT Regulatory Policies and Procedures - February 15, 1979, effective March 1, 1979. The Order:

establishes objectives to be pursued in reviewing existing regulations and in issuing new regulations; prescribes procedures and assigns responsibilities to meet those objectives; and establishes a Department Regulations Council to assist and advise the Secretary in achieving those objectives and improving the quality of regulations and the policies and practices which affect the formulation of regulations.

Rulemaking Support Paper - NHTSA's initial documentation supporting and analyzing a rulemaking project. The Rulemaking Support Paper is prepared by the NHTSA's Rulemaking office and is an internal document which forms a basis for a formal notice. It is not generally released to the public.

Safety Act of 1966 - The NHTSA's authority for its mission derives from the National Traffic and Motor Vehicle Safety Act of 1966 (Safety Act of 1966). The NHTSA is responsible for establishing and enforcing national standards for improving safety in the operation and performance of motor vehicles and equipment. A motor vehicle safety standard is defined in the Act as "a minimum standard for motor vehicle performance, or motor vehicle equipment performance, which is practicable, which meets the need for motor vehicle safety and which provides objective criteria."

The Safety Act of 1966 authorizes additional activities on the part of the NHTSA, such as vehicle defect investigations and research development. Also in 1966, under the National Highway Safety Act, the NHTSA was given authority to administer a grant-in-aid program to enhance the States ability to implement traffic safety improvements. Under more recent legislation, the NHTSA is charged with the development of Federal standards in such other specific areas as bumper performance, odometer integrity, and fuel economy.

APPENDIX



Office of the
Chairman

**National Transportation
Safety Board**

Washington D C 20594

March 26, 1980

Honorable Joan Claybrook
National Highway Traffic Safety Administration
400 Seventh Street, S. W.
Washington, D. C. 20590

Ref: Docket No. 74-14: Evaluation Plan
for FMVSS 208: Occupant Crash Protection

Dear Ms. Claybrook:

In March 1979, the National Transportation Safety Board published an assessment of the National Highway Traffic Safety Administration's plans for evaluating the effectiveness of FMVSS 208: Occupant Crash Protection. The Board concluded that NHTSA's plans at that time were not adequately organized, and recommended that the NHTSA develop and publish for comment a detailed plan. The Board report discussed a number of elements that the Board believed should be addressed in the NHTSA's plan.

The Board is pleased that the NHTSA has responded to this recommendation in a timely and very thoughtful manner. The plan addresses several of the elements the Board believes to be important for a sound and credible evaluation program. In particular, the NHTSA's plan proposes to explore a range of issues beyond the fatality and injury reduction effectiveness of passive restraints and the rates of automatic belt usage, as the Board recommended. Exploration of these additional issues will provide information of significant use in evaluating the overall impact and benefits of major Federal safety regulations.

The publication of the anticipated timetable for collection of data and completion of the evaluation projects, and the assurance that the NHTSA will periodically publish reports on the progress of the evaluation program, is also sound policy. The Board believes such measures will improve NHTSA's evaluation effort by permitting the wide range of persons and organizations interested in the successful implementation of FMVSS 208 to

keep abreast of its progress and to offer suggestions and comments during its crucial early stages, thereby increasing the credibility of the final evaluation findings.

There are several ways in which the evaluation plan can be further improved. The Board's suggestions are discussed below.

1. In subsequent presentations of the evaluation plan, the NHTSA should indicate what organizational units will be in charge of coordinating the data collection and analysis efforts, and the units which will be in charge of individual projects within the plan. This will facilitate public involvement in the program and assure that the program is well coordinated and receives the priority attention it deserves.

2. Because of the acknowledged deficiencies in State accident data files (as distinct from FARS data), the high cost of improving the files and the uncertainty that adequate, timely improvements will be forthcoming, the Board suggests foregoing the use of these data to support the 208 evaluation program. Although the Safety Board certainly believes that the NHTSA should vigorously seek improvements in State data systems (as mandated in the Highway Safety Program Standards), in this case the 208 evaluation program funds would be better spent on expanding the sample collected through the NASS special study of automatic restraint systems. Although questions about such issues as the threshold criterion for accident sampling used in the NASS system remain unresolved, the Board believes the NASS will be the most reliable data collection system available during the period of this evaluation, and expansion of its use is preferable to uncertain attempts to improve the State files.

Likewise, the Safety Board recognizes that clinical analyses conducted by multidisciplinary accident investigation teams are an important element of the 208 evaluation effort. Nevertheless, the Board suggests that the NHTSA also consider reducing the investigations proposed for the multidisciplinary in-depth investigation teams, and applying the resources to the NASS special study effort. Much of the data to be collected by the MDAI teams could duplicate data which can be collected under the NASS; and using the NASS teams may eliminate some of the problems of missing data and uncertain notification that reduce the reliability of the MDAI effort. In any case, the Board believes that any MDAI activity should be closely integrated with the NASS special study.

3. There are at least two additional issues which the Board believes should be addressed in the effectiveness evaluation: (a) the rate of lap belt usage with air bags (it is not clear from the plan that this will be determined, but it is important in determining the effectiveness of the total air bag system); and (b) information to further clarify the relationship of real-world injury levels to the surrogate injury levels as measured on test dummies in the laboratory could be usefully collected and analyzed in this program.

4. A number of the issues ranked by the NHTSA as third priority, to be addressed only "if resources permit," are issues which the Board believes must be explored for sound evaluation of FMVSS 208: "What crash injuries do users of the various automatic restraint systems experience?"^{1/} "How are various production automatic belts disconnected or otherwise not used? What are the reasons for disconnecting or not using them?"; and "How often are deployed air bags not replaced in cars that are crashed and later repaired?" The first of these questions is extremely important in considering whether and how to refine FMVSS 208 and for the manufacturers to redesign automatic restraint systems, if necessary, for maximum injury-reduction effectiveness. The answers to the latter two questions provide important information for assessing the real ability of passive belts and air bags to provide protection in crashes. The Board believes that some of the questions considered by the NHTSA as second priority may be of less importance than those noted above. For example, "What is the cost of automatic restraints?" or "What is the cost of replacing automatic belts or air bags deployed in crashes?"

Another issue ranked by the NHTSA as third priority is the effectiveness of NHTSA's "public information" programs on restraint purchase and usage. It is not clear what sorts of efforts the NHTSA includes within such programs or to what segments of the population such programs will be directed. Although the Board recognizes that it will be difficult to distinguish the effects of such programs from other influences on consumers' decisions, we believe it is extremely important that the NHTSA provide leadership and support not only to programs to provide "information" but also to vigorous public education programs on restraint use, both passive and manual. As the NHTSA acknowledges, manual belt systems will be an

^{1/} This third priority issue seems to be identical to one listed as first priority: "What injuries do people in crashes receive with automatic restraints?"

important means of occupant protection for several years after passive restraints become widely available, and the public has not yet been well educated as to the importance of these systems in protecting them from unnecessary injury and death. Furthermore, the effectiveness of passive systems can be seriously eroded or lost altogether if they are disconnected or used improperly or incompletely, or left unrepaired. A well-constructed education program on all available restraint systems, including classroom education of children, should be a vital part of the NHTSA's mission.

In this connection, the NHTSA also plans to "evaluate public satisfaction with the Standard," and proposes to conduct several public surveys on this question. However, other information being collected in this program will also reveal aspects of "public satisfaction" and should be considered part of the public satisfaction evaluation. For example, information on automatic belt use rates, lap belt use rates with air bags, and rates of failure to repair malfunctioning systems or to replace deployed air bags will all be important in evaluating public attitudes toward restraint systems--perhaps more revealing than the answers given to survey questions.

5. It is not clear from the plan that the NHTSA plans to set aside some contingency funds for responding to a variety of unforeseen circumstances that may arise in the implementation of this evaluation. It could be well to do so.

In addition, the NHTSA may be able to reduce the costs of this evaluation by seeking more extensive involvement of both the automobile and insurance industries. Both have been extensively involved in the development of FMVSS 208 and will be significantly affected by its implementation. Both can make unique contributions to its evaluation.

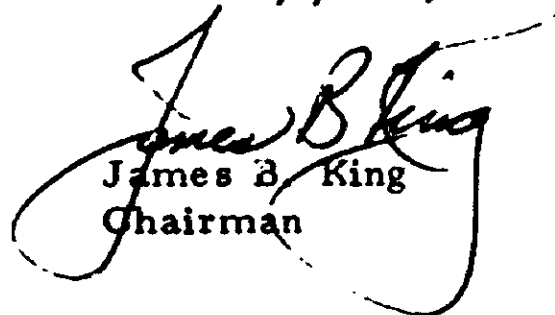
For example, analysis of medical coverage claims forms by the insurance industry could be a good source of information on changes in injury severity in crashes as a result of the introduction of passive restraint-equipped vehicles. Such a source would probably provide better information, in fact, than State accident data files, even if supplemented with an enhanced data collection program such as the LARS.

Finally, the NHTSA should clearly identify the statistical techniques it will use to analyze the data being collected in the evaluation program, as recommended in the Safety Board's March 1979 report. In the past, use of

different statistical analysis techniques has resulted in, for example, widely different estimates of the effectiveness of restraint systems, even when the techniques were applied to the same base data. It is important, therefore, that the techniques planned for use be clearly identified from the beginning, and that potential disagreements about their appropriateness and validity be resolved early in the evaluation, before such disagreements undermine the credibility of the evaluation findings.

Evaluating the wide range of issues inherent in the implementation of a safety standard of the magnitude of FMVSS 208 is a difficult and costly task. Nevertheless, such an evaluation is important to resolve the controversy about the standard, to discover if there are ways the standard or the devices can be improved, and to find ways to increase motorists' full and proper use of restraint systems. The Board commends the NHTSA for its clear commitment to undertake this task, and looks forward to the further refinement and successful implementation of the evaluation plan.

Sincerely yours,



James B. King
Chairman

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